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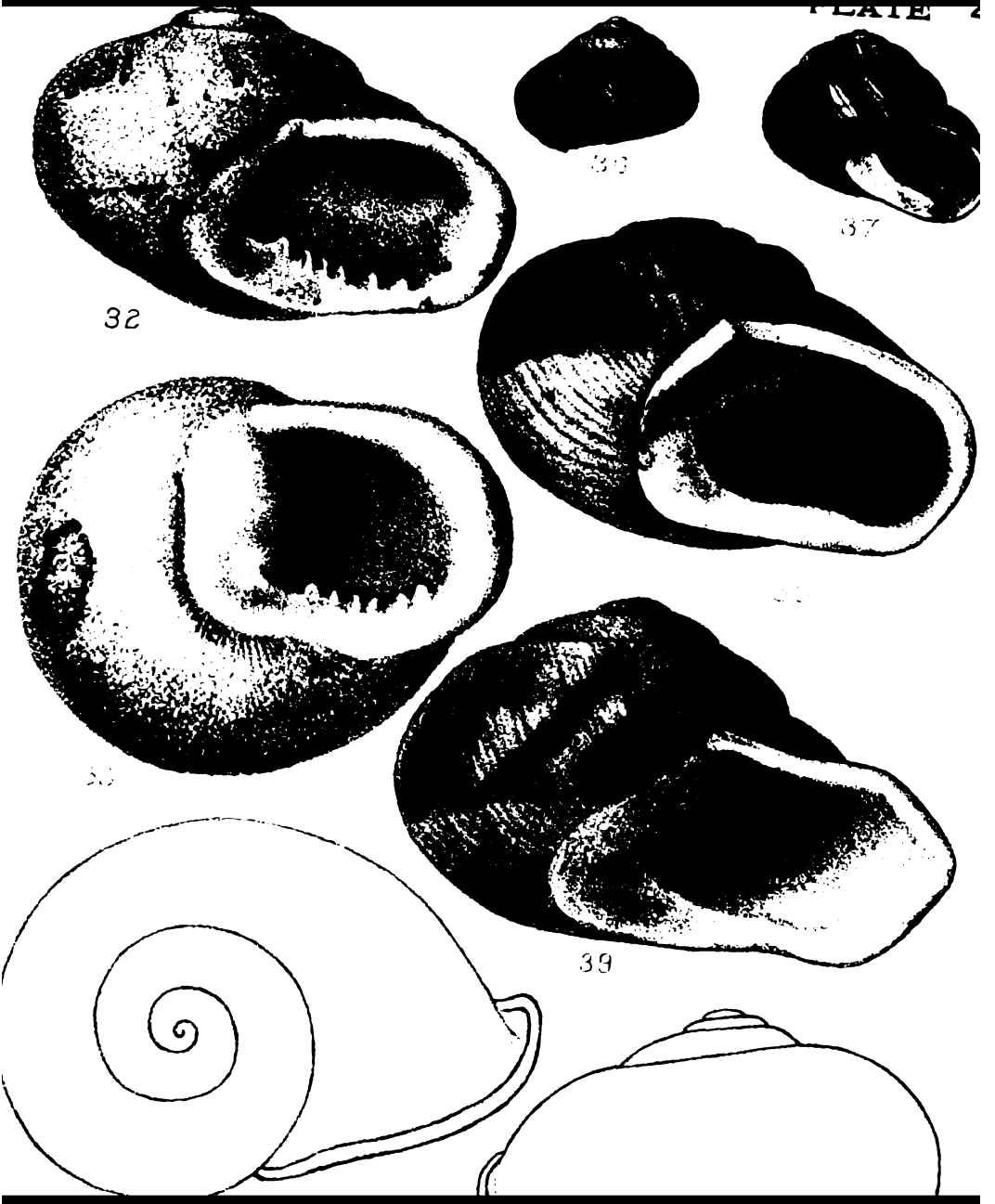

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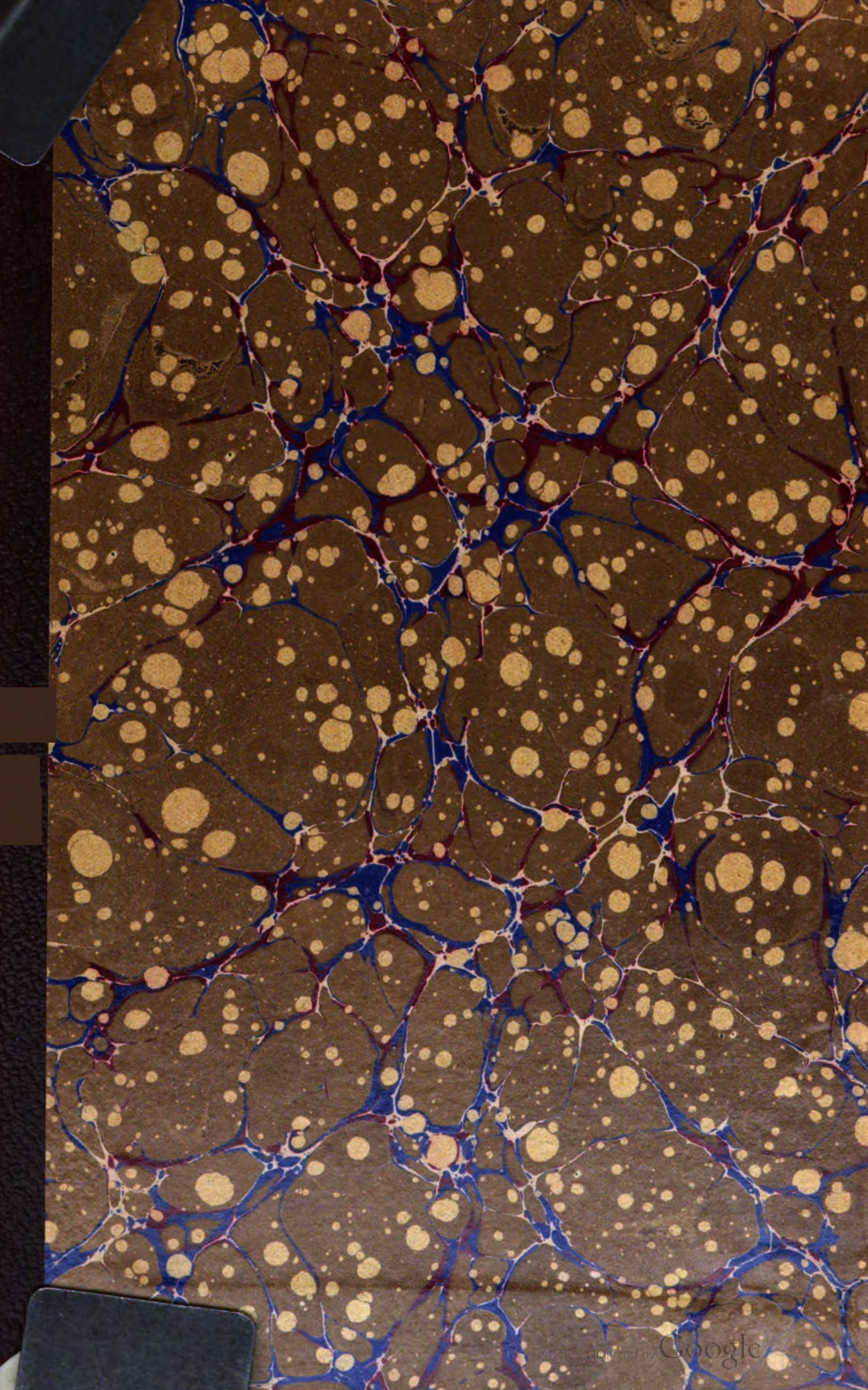
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V

SECOND SERIES: PULMONATA.

MANUAL

OF

CONCHOLOGY;

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WITH ILLUSTRATIONS OF THE SPECIES.

FOUNDED BY

GEORGE W. TRYON, JR.

CONTINUED BY

HENRY A. PILSBRY, SC.D.,

SPECIAL CURATOR DEPARTMENT OF MOLLUSCA, ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

Part .....

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PUBLISHED BY THE CONCHOLOGICAL DEPARTMENT
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VOL. V.

HELICIDÆ:—Vol. III.

PHILADELPHIA:

Published by the Conchological Section,

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When in February, 1888, the task fell to me of continuing the Monograph of the Helices left unfinished by the eminent Conchologist GEO. W. TRYON, it seemed to me desirable that the work should be completed on essentially the same plan followed in the two volumes of Helicoids already issued. A year's experience has convinced me, however, that certain changes would increase the utility of the work to the naturalist; and in the present volume these modifications have been carried out. Chief among them are the introduction of complete synonymy into the body of the work (instead of reserving it for the index), and the preparation of fuller descriptions, noticing every character shown by the specimens before me of each species,—a step which the critical, analytical methods of modern Malacology has made necessary. In no group known to me are species separated upon slighter differences than in the Helices. In many subgenera not only are figures necessary for satisfactory determination of the species, but descriptions extending to the most minute and microscopic details of sculpture and form.

Without entering at length upon the much-debated and profitless question of what constitutes a species, the author may state that in the present work any race of similar forms is regarded as a *species* if it exhibits characters tangible enough to admit of definition and recognition, and has not been shown to be actually united by *recent* intermediate forms with allied races. Of course when the Tertiary fauna becomes known, many of our distinct species will prove to be united with others; but for present purposes, it is enough that there is a hiatus or break in the chain of forms which enables us to define and separate a group of individuals from all other recent groups. A *variety* differs from a *species* only in this: coalescence of its characters with other forms actually occurs in some individuals. It follows that forms not very different may often be regarded as separate

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species, while organisms apparently quite diverse may be treated as *varieties*, simply because they are united by a series of intermediate forms.

In cases where I have no specimen of a species, I have given a translation of the original diagnosis, followed by the name of the author from whom it is taken, together with any additional information I have been able to obtain concerning it.

Anatomical details have been omitted because the preceding volumes of Helix lack them. Under these circumstances it is more convenient to present all of this part of the subject in one place. The final volume treating of Helices will therefore contain besides other matter, a résumé of the anatomy of each subgenus of the Helices. Collectors having either fresh or alcoholic material for sale or exchange are invited to correspond with the author.

In the preparation of the present volume the author has been peculiarly fortunate in the opportunities for study afforded by a collection of West Indian Land shells perhaps the largest in existence; the extensive collections of ROBERT SWIFT and of A. D. BROWN having in recent years been united to the already large suites received by the Academy from POEY, ARANGO, BLAND, WRIGHT, REDFIELD, and other workers in this fauna.

H. A. P.

PHILADELPHIA, *March*, 1889.

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MANUAL OF CONCHOLOGY.

FAMILY *HELICIDÆ*, Vol. III.

Genus HELIX, Linn.

Group XI. HEMITROCHUS Swainson, 1840.

The subgenera or sections which I have assembled under the above name, form a perfectly natural group, allied as well by the characters of the soft parts (as far as these are known) as by the shells. The group includes some of the most brilliantly painted of all Helices. Unlike shells of the groups *Pentatænia and Arionta* the decoration of these forms follows no rule as to the number and disposition of bands. The surface is smooth or simply obliquely striate, never granulated; the lip is simple, acute, or expanded and thickened; the aperture is not obstructed by teeth except in some species of *Plagioptycha*. All of the species are confined to the West Indian islands from Hayti and Jamaica northward, including the Bahamas. *H. varians* Mke. is the only species found upon the mainland of America; and its range does not extend further north than the southern extremity of Florida.

This Group is composed of part of the elements included by Fischer in each of his subgenera *Helicogena* and *Polymita*. (Manuel de Conch., p. 471).

Synopsis of Sections.

Section I. CYSTICOPSIS Mörch.

Shell imperforate or narrowly perforate, globose or globose-depressed, generally thin; last whorl not descending at the aperture; peristome acute; not expanded or thickened within; columellar margin arcuate, not flattened, somewhat expanded above. Type, H. cubensis Pfr.

Cuba, Hayti, Jamaica.

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Section II. PLAGIOPTYCHA Pfeiffer.

Shell umbilicate or imperforate, depressed or subglobose, thin, generally subtranslucent; last whorl deflexed at the aperture; peristome slightly expanded, the baso-columellar margin usually reflexed, free or adnate. Type, H. indistincta Fer.

Hayti, Virgin Is. and Bahamas.

Section III. HEMITROCHUS Swainson.

Shells imperforate or narrowly umbilicate, globose-conic or depressed, generally opaque, rather solid, variegated by numerous color-bands; last whorl rounded at the periphery, deflexed at the aperture; aperture oblique; peristome generally somewhat expanded; columellar lip reflexed over or nearly over the perforation. Type, H. varians Mke.

Bahamas, Hayti, Cuba, Fla. Keys.

Section IV. DIALEUCA Albers.

Shell imperforate in the adult, narrowly perforate in the young, conical, elevated or depressed, rather thin; generally banded; last whorl not descending at the aperture, or only very slightly; peristome thin, expanded; columella oblique, dilated, entering in the center of the axis. Type, H. nemoraloides Ad.

Jamaica.

Section V. CORYDA Albers.

Imperforate in the adult, the young narrowly perforated; globose-conoidal, strong, solid, conspicuously banded or streaked; last whorl abruptly deflexed at the aperture; peristome slightly expanded, labiate within; columella oblique, dilated, flattened, entering in the center of the axis. Type, H. alauda Fér.

Cuba.

Section VI. JEANNERETIA Pfeiffer, 1877.

Shell narrowly umbilicate, globose-conoidal, rather thin, corneous or yellowish, banded with brown; *whorls closely spirally grooved,* the last deflexed at the aperture, constricted behind the peristome; aperture oblique, rounded-lunar; peristome expanded, subreflexed, white, columellar margin sometimes with a tubercular or square tooth. Type, H. multistriata Desh.

Cuba.

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Section I. CYSTICOPSIS Mörch, 1852.

Cysticopsis MÖRCH, *Cat. Yoldi*, p. 2.—ALBERS-MARTENS, *Die Heliceen*, 1860, p 144.

Cysticopsis as here constituted consists of two groups of species, viz. Jamaica shells of the type of H. tumida Pfr. and Cuban species like H. cubensis Pfr., the only species mentioned by Mörch, and therefore, of course, the type of the Section. I do not know whether these two elements of the section will prove to have the same organization when the animal of H. cubensis and its allies is examined, but do not anticipate any considerable difference. Cysticopsis may be distinguished from Plagioptycha by the sharp lip, not expanded, and the last whorl not deflected at the aperture; from Hemitrochus by the lighter texture, plainer coloration, and thin, acute peristome.

* * *

Jamaica Species.

H. MACMURRAYI C. B. Adams. Pl. 12, fig. 32.

Imperforate, globose-depressed, solid but rather thin, covered with a yellowish chestnut colored thin cuticle, usually rubbed off the whorls except the last, regularly marked with wrinkles of increment; spire low-conical, very obtuse, apex flat; sutures at first linear, becoming impressed; whorls about 5½, slightly convex, the last large, rounded; aperture wide-lunar, slightly oblique; outer and basal lips thin, acute, regularly arcuate, columellar lip slightly oblique, a rounded pillar of shining callus, dilated in the region of the umbilicus.

Alt. 35, diam. maj. 45, min. 38 mill.; alt. 40, diam. 48 mill.

Jamaica.

H. MACMURRAYI AD., *Contr. to Conch.*, 1849, p. 32.—REEVE *Conch. Icon.*, f. 208.—PFR. in *Conchyl. Cab.*, p. 302, t, 126, f, 7, 8.

The largest species of the section; readily distinguished by the rounded pillar-lip and the size.

H. BUDDIANA C. B. Adams. Pl. 20, figs. 82, 83.

Imperforate, globose, thin, covered with a thin golden-brown cuticle, which under a lens seems to be minutely pitted on the upper surface; obliquely marked by wrinkles of increment; *spire depressed, apex obtuse,* sutures well-impressed from the apex down;

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whorls 4 to 4½, convex, the last wide, globose; aperture slightly oblique, rotund-lunar; peristome acute, outer lip regularly arcuate, its junction with the pillar-lip marked by a blunt angle; pillar-lip sigmoid, dilated and closely appressed over the umbilical tract, thin, its face concave.

Alt. 23 diam. maj. 29, min. 27 mill.; alt. 11, diam. 13½ mill.

Westmoreland, Jamaica.

H. buddiana C. B. Ad., *Contrib. to Conch.*, No. 9, p. 171, (1851). —Pfr., *Monogr.*, iii, p. 28.—Reeve, *Conch. Icon.*, f. 296.

Allied to the preceding in the blunt apex; separated from it by the impressed suture of the spire, flat columella, etc. The measurement first given above are for a large variety received from Bland (fig. 83).

H. tumida Pfeiffer. Pl. 12, fig. 40; pl. 31, fig. 4.

Imperforate, globose-conical, thin, light chestnut colored, tinged with olivaceous; lightly obliquely marked with growth lines, sometimes with traces of spiral lines; spire small, conical, upper whorls whitish, *apex acute, not depressed*, minute; sutures well-impresssd from the beginning; whorls 5, convex, the inner gradually, the last rapidly widening, rounded; aperture slightly oblique, rotund-lunar; peristome acute, outer lip regularly arcuate; slightly angled where it joins the columella; pillar lip thin, slightly concave or sigmoid, dilated around the umbilical tract.

Alt. 23 diam. maj. 27 mill.

Jamaica.

A. tumida Pfr., *P. Z. S.* 1845, p. 130.—Reeve, *Conch. Icon.* f. 237.—*H. tunicata* C. B. Ad., *Contrib. to Conch.*, No. 3, p. 33.

This form has a more persistant cuticle than the two preceding. It has a conical spire, with *minute elevated apex.* Large specimens of H. buddiana are similar in the aperture to this species, but the apical whorl is flattened. The following species is like tumida in having an acute apex, but the general form of the shell is more depressed.

H. renerrima C. B. Adams. Pl. 12, figs. 36, 37.

Imperforate, depressed, fragile, corneous brown, obliquely marked by growth-wrinkles; spire low-conical, apex minute, acute; suture impressed from the beginning; whorls 5–5½, convex, the outer wide, rounded; aperture wide-lunate, oblique; outer lip acute, thin,

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regularly curved; columellar lip slightly oblique, nearly straight, white, dilated. Alt. 12, diam. 15 mill.; alt. 12, diam. 18 mill.

Jamaica.

H. tenerrima AD. *Proc. Bost. Soc. N. H.*, 1845, p. 16.—PFR. in *Conchyl. Cab.*, t. 29, f. 5–8.—REEVE, *Conch. Icon.*, f. 269.

This species is allied to H. tumida, but is smaller, more fragile and more depressed. The acute apex will separate it from H. buddiana

My description is drawn from specimens received from Prof. ADAMS.

VAR. MUNDA C. B. Adams. Pl. 12, fig. 35.

Shell depressed-globular, with a rather thick epidermis which is horn colored on the upper whorls, and greenish-brown on the rest; with excessively fine striæ of growth; spire convex, moderately elevated; apex very obtuse; whorls 5, moderately convex, with a well-impressed suture; last whorl large, somewhat depressed; aperture suborbicular, angular at the end of the oblique white columella, and modified considerably by the penultimate whorl; lip excessively thin and sharp; umbilicus wanting. Alt. 10, diam. 15 mill. (*Adams*).

Jamaica.

H. munda AD., *Cont. to Conch.* p. 32, (1849).—PFR. in *Conchyl. Cab.* t. 108, f. 21, 22.—REEVE, *Conch. Icon.* f. 297.

I have copied Adams' description of this form, because it *may* prove to be distinct from the preceding. Numerous specimens before me, however, are scarcely more obtnse at the apex than H. tenerrima and are better described by Pfeiffer's words, "Spira obtusiuscula" than by Adams' phrase, "Apex very obtuse."

H. COLUMELLATA C. B. Adams. Pl. 12, fig. 31; pl. 31, fig. 5.

Imperforate, globose-conical, very thin, showing under a lens minute scars or punctations all over; spire conoidal, apex acute minute, sutures well-impressed from the beginning, whorls about 6, convex, slowly widening, the last more rapidly widening, generally somewhat compressed above the periphery, causing the whorl to be sloping, and a little shouldered beneath the suture; aperture obliquely lunate, small; outer lip very thin, acute; columellar lip oblique, thickened within by a very heavy white callus, which is abruptly truncated below. Alt. 16. diam. 18 mill.

Jamaica.

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H. columellata AD., *Contrib. to Conch.*, p. 80, (1850).—PFR., *Monographia*, iii, p. 30.—REEVE, *Conch. Icon.*, f. 298.

Separated from the other forms by the strong white callus of the columella, which in adults is truncated below.

* * *

Cuban Species.

H. CUBENSIS Pfeiffer. Pl. 19, figs. 26–29.

Imperforate, globose-depressed, fragile, white, roseate or yellowish, unicolored, or encircled by one or two continuous brown bands, or by numerous spiral bands broken into flecks or short longitudinal streaks, usually with a continuous peripheral fascia; surface slightly shining, with light lines of growth; spire low, apex a little obtuse, often pink-tinged; sutures slightly impressed; whorls about 4, the inner gradually, the last rapidly widening; body-whorl depressed; aperture rotund-lunar, slightly oblique; peristome fragile, acute, outer lip well-curved; pillar-lip nearly vertical, nearly straight, expanded at the umbilical region. Alt. 8–13, diam. 12–15 mill.

Matanzas and Havana to Cape S. Antonio, Cuba.

H. cubensis PFR., *Wiegm. Archiv.*, 1840, p. 250; and in *Conchyl. Cab.* t. 29, f. 9–13.—REEVE, *Conch. Icon.*, f. 299.—*H. lanieriana* D'ORB. *Moll. Cuba*, i, p. 159, t. 7, f. 17–20.—*H. gilvus d' Orb.* (in part) t. 8, f. 13–15.—*Microcystis trifasciella* and *M. pictella* BECK, teste PFR.—? *H. penicillata* GOULD, *Bost. Journ.* iv, No. 1, 1842 (cover).

This form differs from all other species of Cysticopsis in being variegated in color, but is allied to them in shape and in the fragile, acute lip. The coloration is extremely variable, as the figures show. Sometimes it is very similar to H. lucipeta Poey, a species of Hemitrochus. The latter species is, however, perforate, and the lip is expanded. I have before me a more obtuse form from Baracoa, Cuba, which is probably the var. *theta* of Pfeiffer, "Spira paulo elatiore" and which he says comes from Jamaica.

Figure 37, pl. 19, represents the common variation which d'Orbigny named H. lanieriana; and fig. 36 is one of the figures of H. gilvus of the same author; his figures 9–12 of "gilvus" represent a Hemitrochus.

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H. COMES Poey.

Imperforate, depressed-globose, somewhat solid, striatulate, shining, corneous-white, with irregularly radiating close castaneous streaks; spire convex, rather obtuse; whorls 4, slightly convex, regularly increasing, the last rounded, periphery frequently marked with a pale line, not descending anteriorly; columella sloping, callous; aperture oblique, rotund-lunar; peristome simple, acute; columellar margin subreflexed, adnate.

Alt. 9, diam. maj. 14, min. 11½ mill. (*Pfeiffer*).

Isle of Pines.

H. cubensis var.? PFEIFFER, *Mal. Bl.*, 1854, p. 176.—*H. comes* POEY, *Memorias* ii, p. 29, (1857?).

I do not know this species. It has not been figured. Poey says: "Differt ab H. cubense umbilico subaperto, colore constanter corneo, rufo transverse multilineato."

H. LETRANENSIS Pfeiffer. Pl. 19, figs. 38, 39.

Imperforate; subturbinate-globose, very thin, scarcely striatulate, pellucid, slightly shining, corneous or rufo-corneous; spire conoidal, rather obtuse; whorls 4, convex, rapidly increasing, the last rounded, encircled sometimes by a pale peripheral line, not descending anteriorly; aperture slightly oblique, rotund-lunate, peristome simple, acute, margins converging, the columellar arcuate, subcallous above, reflexed, and adnate at the umbilicus.

Alt. 6, diam. maj. 10, min. 8⅓ mill; alt. 6½, diam. 8 mill.

S. Juan de Letran, Jurisdiction of Trinidad, Cuba.

H. letranensis PFR., *Malak. Bl.*, 1857, p. 105, and *Monogr.* iv, p. 12.—ARANGO, *Fauna Mal. Cubana*, p. 63.

About the form of a depressed specimen of H. cubensis, but smaller, and never whitish.

H. AUBERI d'Orbigny. Pl. 11, figs. 10–12; pl. 19, figs. 40–42.

Perforate, depressed, thin, lusterless, light corneous, obliquely striatulate; spire low-conical, apex obtuse; sutures well impressed; whorls 4½, moderately convex, the last wider, not deflected anteriorly, convex beneath, and indented around the umbilicus, in front of the aperture indistinctly angulated; aperture broad lunate, oblique; peristome thin, acute, its terminations somewhat approaching, the outer portion regularly arcuate in every part, the columella short, dilated above in a triangular reflection, partly closing the narrow umbilicus.

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Alt. 8, diam. maj. 11, min. 10 mill; alt. 7, diam. 9 mill.

H. auberii, d'ORB. *Moll. Cuba*, i, p. 157, t. 7, f, 13–15.—PFR., *Monographia*, iii, p. 152 and *Conchyl. Cab.* p. 476, t. 158, f. 22–24.

The figures of Orbigny are poor; the species is never gibbous beneath as shown in pl. 11, fig. 11. These figures (10–12) are enlarged. The species may be known by its umbilicus and the depressed, often subangulated body-whorl.

H. HJALMARSONI Pfeiffer. Pl. 31, figs. 14–16.

Imperforate, globose-depressed, thin, fragile, light russet-brown, with a scarcely visible supra-peripheral light fascia, all over elegantly, very regularly and densely plicate-striate, lusterless or nearly so; spire low-conoidal, apex a little obtuse, the first 1¼ whorls smooth, submammillated; suture moderately impressed; whorls 4, the last rapidly widening, rounded, a trifle descending anteriorly; aperture rotund-lunate, slightly oblique, ribbed inside the same as outside; peristome a trifle expanded, its terminations somewhat approaching; right margin regularly arcuate, columellar margin reflexed, a small triangular callus adnate over the umbilicus.

Alt. 8 diam. maj. 11 min. 9½, mill.; alt. 7¾, diam. maj. 12, min. 10 mill.

Sierra Mte. Christi, and Porto Plata, Hayti.

H. hjalmarsoni PFR. *Malak. Bl.* 1858, p. 148, t. 3, f. 1–3, and *Monogr.*, v, p. 286.

Quite distinct in the globose-depressed form and strong, pliciform striæ.

H. PEMPHIGODES Pfeiffer. Pl. 12, fig. 33.

Imperforate, depressed-conoidal, very fragile, sub-translucent nearly lusterless, light russet or brownish corneous, wrinkles of increment rather light, or surface strongly costate; spire conical, apex minute, rather acute; whorls 4, very rapidly windening, scarcely convex, the last angular in front of the aperture, the angle more or less evanescent toward its termination, slightly deflected anteriorly; aperture large, oblique, truncate-oval or rounded-lunar; peristome simple, acute or a little expanded, margins somewhat converging, the pillar-lip reflexed and adnate at the place of the umbilicus. Alt. 14, diam. maj. 19, min. 15, mill.

Eastern Cuba.

H. pemphigodes PFR., *P. Z. S.* 1846, p. 110; *Monographia*, i, p. 35. —REEVE, *Conch. Icon.*, f. 295.—*H. pelliculata* GUNDL. POEY, *Memorias*, ii, p. 7.

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The shell is fragile and Vitrina-shaped, like the next species, but pemphigodes is darker colored and more roughly sculptured.

I do not know whether the unfigured *H. prominula* of Pfeiffer, (*Monographia* v, p. 264, and *Malak. Bl.* 1858, p. 181) from Cabo Cruz, Cuba, is the same as this species or not. I am inclined to believe it a synonym. Arango retains it separate, but apparently derives his information wholly from Pfeiffer. (*Vide Fauna Mal. Cubana*, p. 69.)

H. LESCAILLEI Gundlach. Pl. 31, fig. 8.

Imperforate, depressed-conoidal, very fragile, translucent, whitish, covered with an extremely thin cuticle slightly tinged with green; very subtly obliquely striated; spire conoidal, apex minute, acute, *red-tipped*; whorls 4, slightly convex, rapidly widening, the last subangulate at the periphery; aperture large, rotund-lunate, oblique; peristome acute, margins somewhat converging, right margin curved in every part, columellar margin arcuate, nearly vertically inserted, thin, simple, not reflexed.

Alt. 11 diam. maj. 15, min. 12 mill.

Guantanamo, Eastern Cuba.

H. lescaillei GUNDL., in PFR., *Malak. Bl.*, 1859, p. 89; *Monographia* v, p. 56.—ARANGO, *Fauna Mal. Cubana*, p. 64.

Similar in form to H. pemphigodes, but thinner, smoother, and almost invariably with a minute tip of red on the apex.

H. LUZI Arango.

Perforate, sub-turbinate, thin, closely rugulose-striate, transparent, shining, pale corneous, marked with a supra-peripheral white fascia; spire short-conoidal, apex rather obtuse; whorls 4, slightly convex, rapidly increasing, the last rotund, sensibly descending anteriorly; aperture sub-diagonal, lunate-subcircular, slightly pearly inside; peristome simple, margins subconverging, the right margin simple, acute, basal a little reflexed, at the insertion dilated, reflexed, nearly covering the perforation.

Alt. 8½, diam. maj. 15½, min. 13 mill. (*Pfeiffer*).

Tanamo, Cuba.

H. luzi ARANGO *mss.* PFR. *Malak. Bl.* 1866, p. 58 and *Monogr.* v, p. 232.—ARANGO, *Fauna Mal. Cub.*, p. 68.

Not figured nor seen by me. Apparently allied to H. hjalmarsoni Pfr.

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H. LASSEVILLEI Gundlach.

Imperforate, turbinate, very thin, striatulate, hyaline; spire convex-conoidal, apex somewhat obtuse, concolored; whorls 4, slightly convex, regularly increasing, the last not descending, acutely carinated, moderately convex beneath; aperture nearly diagonal, rhomboid-lunar; peristome simple, acute; columellar margin short, subvertical, scarcely thickened, joining the basal in a curve.

Alt. 8, diam. maj. 11½, min. 10 mill. (*Pfeiffer*).

Gran Piedra, Eastern Cuba.

H. lassevillei GUNDL. in PFR., *Malak. Bl.* 1861, p. 220; *Monogr.* v, p. 57.—ARANGO, *Fauna Mal. Cubana*, p. 64.

Known to me only by the description of Pfeiffer. Unfigured.

H. PELLICULA Férussac. Pl. 12, figs. 47–49.

Subumbilicate, conoid-globose, thin, smooth, yellowish, trifasciate with brown; whorls 4–5, a little flat; aperture lunate-rotund; peristome simple, columellar margin dilated.

Alt. 12, diam. maj. 14, min. 11 mill. (*Fér.*)

Habitat unknown.

H. pellicula FER., *Hist.*, t. 105, f. 1.—PFR. *Monogr.* i, p. 194; *Conchyl. Cab.* t. 72, f. 24–26.

Known to authors only by the description and figures of Ferussac. It may be a *Hemitrochus*, like H. gallopavonis Val.

* * *

H. jaudonesi CISNEROS, *mss.* ARANGO, *Annal de la Real Acad. de C. Méd. fis. y Nat. de la Habana*, xii, p. 281.

Probably belongs to Cysticopsis. I do not have access to the publication containing the description.

Section II. PLAGIOPTYCHA Pfeiffer, 1856.

Plagioptycha PFR. *Malak. Blät.* 1856, p. 135.—ALBERS-MARTENS *Die Heliceen* 1860, p. 145.

* * *

Perforate or umbilicate; columellar lip expanded, not adnate to the base.

H. INDISTINCTA Ferussac. Pl. 11, figs. 21–24.

Nearly covered perforate, depressed, thin, subtranslucent, brownish horn-color, with usually a pale supra-peripheral fascia; more or

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less strongly rib-striate; spire low conic, apex subobtuse, smooth, shining, not darker than the remainder of the shell in color; sutures moderately impressed; whorls 4½, moderately convex, the last rounded or very obtusely subangular at the periphery, suddenly and rather deeply deflexed anteriorly; aperture quite oblique, lunate-elliptical, peristome white, simple above, reflexed beneath and thickened within by a more or less developed elongated callous tubercle; columella reflexed partly over and nearly covering the narrow umbilicus. Alt. 7, diam. 10 mill; alt. 8, diam. 13 mill.

Hayti.

H. indistincta FER., *prodr.* 82; *Hist.*, t. 38, f. 1.—PFR., *Symbolæ*, ii, p. 30; *Monogr.* i, p. 194; *Conchyl. Cab.* p. 153, t. 93, f. 5, 6.—REEVE, f. 776.—CROSSE & FISCHER, *Moll. Mex. et l'Amer. cent.*, p. 299.—*H. disculus* DESH. in FER., *Hist.*, i, p. 95, t. 89, f. 6.—PFR. *Malak. Bl.* 1858, p. 150; and *Monogr.* iii, p. 243.

The internal callus or tubercle of the basal lip is not removed from the edge of the aperture, as it is in many of the species; nor is it so much so as fig. 22 of the plate seems to indicate. Crosse and Fischer are doubtless correct in discrediting the habitat "*Mexico*," given by Pfeiffer. The following form is almost abnormally depressed, but does not seem distinct.

VAR. DISCULUS Deshayes. Pl. 12, figs. 41–43.

Orbiculate-conoid, depressed, spire very flat; whorls 5, wide, finely and regularly striate, the last broad, perforate beneath, convex, rather depressed; aperture ovate-lunar, dilated, margins white, reflexed; peristome dilated and reflexed over the umbilicus, with a submarginal tooth below. Alt. 6, diam. 15 mill. (*Desh.*)

Hayti.

Var. CHROMOCHILA Pilsbry. Pl. 19, fig. 30.

Similar to the type, but with reddish apex and reddish-brown peristome, more broadly expanded than in typical H. indistincta.

Hayti.

H. STRUMOSA Pfeiffer. Pl. 11, figs. 27–29.

Umbilicate, depressed, thin, obliquely costulate, diaphanous, scarcely shining, flesh-colored rufous, ornamented with a pale fascia bordered above and below with reddish; spire scarcely elevated, rather obtuse; sutures profound; whorls 4½, slightly convex, sensibly increasing, the last subangular above, deflexed anteriorly, behind the aperture gibbous and then constricted, base convex; umbilicus

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moderate, infundibuliform; aperture very oblique, lunate-oval, shining within; peristome thin, margins approximating, the superior one deeply curved, a little expanded, base margin briefly reflexed, with an oblique fold within.

Alt. 7, diam. maj. 16½, min. 13⅔ mill. (*Pfeiffer*).

Hayti.

H. strumosa Pfr. *P. Z. S.* 1852, p. 139; *Conchyl. Cab.* p. 478, t. 158, f. 25–27; *Monogr.* iii, p. 243.—Reeve, *Conch. Icon.* f. 763.

I have not seen this species. It may be known by the gibbous and constricted whorl behind the aperture, and the umbilicated base. It may perhaps prove to have more affinity with H. santacruzensis and H. phædra than with the species with which it is here grouped.

H riisei Pfeiffer. Pl. 11, figs. 33, 34.

Imperforate, conoid-depressed, rather solid; smooth, whitish, subdiaphanous, encircled by a single reddish line; spire very short, conoid; whorls 4½, scarcely convex, the last depressed-rotund, sensibly descending anteriorly; aperture very oblique, sub-lunar; peristome sublabiate, the margins subparallel, right lip slightly expanded, columella flat, with a compressed, transverse fold within.

Alt. 8½, diam. 15 mill. (*Pfr.*)

Ins. Viéque.

H. riisei Pfr. *Mal. Blät.* iii, 1856, p. 44; *Novit Conch.* i, p. 77, t. 21, f. 13, 14.

H. platonis Pfeiffer. Pl. 19, figs. 48–50.

Very narrowly umbilicate, depressed-turbinate, thin, finely costulate-striate, scarcely shining, diaphanous, corneous-isabella colored; spire conoid, apex rather acute, blackish, shining; suture deep, submarginate; whorls 5, convex, the last encircled by two brownish lines, deeply descending anteriorly, flatter beneath, subconstricted anteriorly; aperture very oblique, lunate-oval; peristome thin, the margins scarcely converging, the right margin a little expanded, basal and columella margins much dilated, reflexed, with a dentiform oblique callus within.

Alt. 7, diam. maj. 12½, min. 10½ mill. (*Pfeiffer*).

Mt. Plato, Hayti.

H. platonis Pfr. *Malak. Bl.* 1866, p. 81; and *Monographia*, v, p. 355.

Three specimens of this form, in poor condition, are before me. They are distinguished from the variable H. indistincta by the more

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conical form and two obscure narrow brown bands around the middle of the body-whorl.

H. ALBERSIANA Pfeiffer. Pl. 31, figs. 19–21.

Umbilicate, subturbinate-depressed, thin, brownish corneous, with one or two faint peripheral brown bands sharply, rather irregularly and coarsely rib-striate; spire low-conical, slightly obtuse, apex smooth; sutures moderately impressed; whorls 4½–5, moderately convex, the last rounded at the periphery, very deeply deflexed at the aperture, somewhat flattened and subconstricted behind the peristome on the base; aperture very oblique, truncate-oval; peristome thin, well expanded, especially below, where it is thickened within by a linguiform callus; terminations joined across the parietal wall in adult specimens by an elevated lamina.

Alt. 7–9, diam. maj. 12–14 mill.

Hayti; Inagua, Bahamas.

H. albersiana PFR. *P. Z. S.* 1851, p. 147.—*Monographia*, iii, p. 231.—REEVE, *Conch Icon.* f. 300.

This form may be known by the coarse, rough striation and in adult shells by the elevated lamina joining the terminations of the peristome. The base of the aperture has a more or less developed thickening callus inside. Many specimens are less elevated than the one figured. There are generally two narrow faint brown bands at the periphery, with a light fascia between them.

H. LOXODON Pfeiffer. Pl. 12, figs. 44–46; pl. 19, figs. 43, 44.

Perforate, depressed, thin, but more solid than the preceding forms, slightly translucent, pale brownish-corneous, sometimes with two ill-defined, narrow, brown fasciæ around the periphery, a light band between them; regularly elegantly and densely costulate-striate; spire low-conical, apex concolored, smooth, slightly obtuse; sutures moderately impressed; whorls about 5, convex, the last rounded at the periphery, deeply descending anteriorly; on the base behind the periphery, constricted. Inside the umbilicus (when it is not too narrow to see in) the last whorl has a spiral furrow or groove—a character not shown by H. albersiana. Aperture oval or oval-truncate, extremely oblique; peristome straight or slightly expanded above, outer and basal margins expanded, the latter reflexed, partly or almost wholly concealing the narrow umbilicus. The basal margin is sometimes nearly straight, sometimes decidedly curved toward the upper lip; it bears an oblique callus ridge inside; parietal callus very light, transparent, its edge never elevated.

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Alt. 6–7, diam. 12–13 mill.

Hayti.

H. loxodon PFR. *Zeitschr. f. Mal.* 1850, p. 73; and *Conchyl. Cab.* t. 133, f. 7–9.—REEVE, *Conch. Icon.*, f. 268.

More regularly and finely sculptured than H. albersiana, and generally with less elevated spire, and less expanded, more reflexed, basal margin to the peristome. There are two forms of aperture; one in which the ends of the peristome converge considerably, the other with the basal margin nearly straight, almost closing the umbilicus by its expansion.

H. BAHAMENSIS Pfeiffer. Pl. 19, figs. 31–33.

Narrowly umbilicate, depressed, thin, white, somewhat shining, very finely obliquely striate; spire low-conical, apex rather obtuse, sutures impressed; whorls 4½, moderately convex, the last subdepressed, descending anteriorly, slightly constricted behind the aperture; aperture very oblique, oval-lunate; peristome simple above, expanded below, terminations converging; base with a strong transverse callous tubercle inside, removed from the edge of the aperture, its position marked outside by a wrinkled tract; umbilicus partly covered by the expansion of the lip; parietal callus very light.

Alt. 6, diam. 10 mill.; alt. 8, diam. 15 mill.

Turk's Island, Bahamas.

H. bahamensis PFR. *P. Z. S.* 1845, p. 66; *Monogr.* i, p. 383; *Conchyl. Cab.* p. 353, t. 41, f. 7–9.—REEVE, *Conch. Icon.* f. 276.

This form seems to me to differ from H. duclosiana in being more elevated, less shining, more strongly striate. It is not so strongly striate as H. albersiana or loxodon. The tooth within the base is stronger and more deep-seated than in the two last-named species. There are usually visible faint traces of one or two brown bands around the periphery.

Var. HOLOSTOMA Pilsbry. Pl. 19 figs. 34, 35.

More coarsely striate than the type; ends of the peristome connected by an elevated parietal lamina; basal tubercle deep-seated, rather elongated, not marked by a rugose spot outside.

Alt. 6½, diam. 11 mill.

Turk's Island, Bahamas.

Probably a distinct specific type.

H. SARGENTI Bland.

Subperforate, globose-depressed, obliquely striated, thin, pale,

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horn colored? ; spire short, apex obtuse; whorls 5, rather convex, the last descending at the aperture, obsoletely angular at the periphery, base subplanulate; aperture oblique, lunate-rounded; peristome with the margins approximating, right margin somewhat expanded, columellar margin much dilated above, reflected, nearly covering the perforation; basal margin with a lamelliform callus within.

Alt. 8, diam. maj. 15, min. 13 mill. (*Bland.*)

This, in general form is much like *H. duclosiana* Fér. but the interior projecting tooth is wanting, and the callus on the basal margin is more developed. (*Bland.*)

Little Inagua, Bahamas.

H. sargenti BLD. *Ann. Lyc. N. H. of N. Y.*, xi, 1876. p. 79—PFR. *Monographia* vii, p. 472.

H. DUCLOSIANA Ferussac. Pl. 11, figs. 30–32; pl. 31, figs. 1–3.

Umbilicate, depressed, thin, subtranslucent, very smooth and shining all over, light brownish straw-colored; surface with minute oblique growth-lines; spire very low-conical, apex subobtuse; sutures impressed; whorls 5, slightly convex, the last depressed, deeply deflected anteriorly, flattened beneath; subconstricted and more or less excavated behind the peristome on the base; umbilicus with a slightly marked spiral furrow within; aperture truncate-oval, very oblique; peristome thin, upper margin simple, outer and basal margins expanded, the ends converging; base with a deep-seated, strong, white, triangular tooth within, its position marked outside by a shallow rugose depression. Alt. 8, diam. 18 mill.; alt. 7, diam. 13 mill.

New Providence, Bahamas.

H. duclosiana FER., *Hist.*, t. 51A, f. 6. (1832)—DESHAYES, in FER. *Hist.*, i, p. 207.—PFR., *Monogr.*, iii, p. 243.—COX, *Austr. Land sh.*, p. 47, t. 11, f. 2. (from Fér.)—(*H. macrodon* MENKE, teste Desh.?) —*H. salvatoris* PFR. *Malak. Bl.* 1867, p. 127; and *Monographia* v, p. 245.—MARTENS, *Conch. Mittheil.*, i, t. 2, f. 1, p. 3.

This shell is rather large, generally flat, but sometimes small specimens are quite conoidal, narrowly umbilicated and very smooth and shining. I separate the bahamensis of Pfeiffer from duclosiana on account of its more strongly striate, less shining surface.

Var. SALVATORIS Pfeiffer. Pl. 11, figs. 13–15.

This form may be distinguished by its less tubercular, more elongated callus within the base, nearer to the margin than in typical H

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duclosiana, and more nearly parallel to the lower lip. In all other characters it is like H. duclosiana.

Eleuthera and San Salvador, (or Cat Island) Bahamas.

Var. ABACOENSIS Martens. Pl. 12, figs. 50–52.

Narrowly umbilicated, depressed conoid, rather thin, obliquely rugose-striate, yellowish white, with a pure white peripheral fascia, bordered on both sides with rufous; spire short-conoidal, apex obtuse; whorls 4½, slightly convex, the last subdepressed, deflexed anteriorly, the base moderately convex; aperture diagonal, truncate-oval; peristome within subroseous, distinctly albo-labiate, its margins converging, the upper margin simple, lower narrowly expanded, provided with an oblong dentiform callus within; columellar margin much dilated at the insertion, half covering the umbilicus.

Alt. 9, diam. maj. 14½, min. 12 mill. (*Pfeiffer.*)

Abaco Id., Bahamas.

It is separated from the normal H. duclosiana Fer. by the stronger sculpture, less depressed form, and the white, red-margined peripheral band. (*Pfr.*)

H. duclosiana var. abacoensis Martens, PFR. in *Novitates Conch.* v. p. 187, t. 154, f. 9–11.

I simply follow Pfeiffer in placing this form here. It seems to me to be more nearly allied to several of the species preceding H. duclosiana than to that form. I have seen no specimens of Plagioptycha from Abaco (one of the northermost islands of the group,) so I have not identified the variety.

H. MACROGLOSSA Pfeiffer Pl. 31, figs. 9–13.

Perforate, depressed or subturbinate-depressed, thin, somewhat shining, corneous, with a distinct supra-peripheral dark brown fascia; minutely striated; spire low-conical, or quite depressed; sutures slightly impressed; whorls 4½, slightly convex, the last deeply descending anteriorly; aperture very oblique, truncate-oval; peristome simple, the baso-columellar margin expanded, partly closing the umbilicus, ends converging or not. Within the base there is a rather deep-seated, strong, oblique tubercle, its position indicated outside by a slight flattening and wrinkling of the surface.

Alt. 6–7, diam. 11–13 mill.

Great Inagua Id., Bahamas.

H. macroglossa PFR., *Malak. Bl.* 1866, p. 115; and *Monographia*, v. p. 234.

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This form is allied to duclosiana in the deep-seated, strong tubercle of the base; but differs in being generally smaller, less shining, and in the dark supra-peripheral fascia.

* * *

Imperforate; columellar lip adnate to the base.

H. MONODONTA Lea. Pl. 11, figs. 16, 25.

Imperforate, globose-depressed, thin but strong, generally opaque, whitish, with usually a supra-peripheral brown fascia, and numerous narrow brown lines, and sometimes sparsely dotted with b lackish or brown; often nearly unicolored brownish, or subtranslucent corneous; surface scarcely marked by growth-lines, shining, smooth; spire low-conical, apex subobtuse; sutures well-impressed; whorls 4 to 4½, somewhat convex, rapidly widening, the last rounded, very deeply and abruptly deflexed anteriorly; aperture subhorizontal, rather small, oval-truncate; terminations of the peristome converging; superior lip strongly arched, outer lip arcuate, narrowly expanded, baso-columellar margin straight, expanded, adnate toward the center of the base, bearing a strong tubercular fold or tooth on its inner edge. Alt. 8, diam. 13 mill.

Hayti.

H. monodonta LEA, *Obs. gen. Unio, etc.*, i, p. 165, t. 19, f. 62, (1831)—PFR. in *Conchyl. Cab.* t. 63, f. 1–4.—REEVE, *Conch. Icon.* f. 294.—*H. haitensis* W. ET M. *Malak. Bl.* 1859, p. 17.—PFR., *Monogr.* v, p. 304.—*H. acuminata*, PFR. *Zeitsch. f. Mal.* 1851, p. 16; *Conchyl. Cab.* t. 140, f. 7, 8, p. 373; *Monogr.* iii, p. 190.—REEVE, *Conch. Icon.* f. 785.

An abundant species, very variable in coloration. The aperture is a little rounder than in H. haitensis, the lip is more expanded, more strongly toothed within, and the shell is usually more variegated.

Var. HAITENSIS Weinland et Martens.

The general form and appearance of this shell is like H. monodonta. It is more fragile, translucent, "isabella-colored," with a sutural opaque white fascia, and often a narrow brown band above the periphery. The peristome is thin, expanded; the columellar is tooth scarcely developed. Alt. 7½, diam. 13 mill.

H. acuminata Pfr. (pl. 11, fig. 26) seems to be the same as H. haitensis in all respects.

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H. NEMORALINA Petit. Pl. 11, figs. 9.

Imperforate, depressed, thin but rather strong, whitish brown or yellowish, sometimes rose-tinted, with a supra-peripheral narrow dark brown fascia, bordered below by opaque white; surface very finely striate, nearly smooth, shining; spire low-conical, apex obtuse; whorls 4, slightly convex, the inner ones colored like the last or more rosy, rapidly increasing, the last rounded, depressed, briefly descending anteriorly; aperture oblique, truncate-oblong; peristome simple above, narrowly expanded on the outer margin; upper and lower margins subparallel, not converging; baso-columellar margin adnate to the base, widened toward the insertion, with a flat pink face, rarely white; inner edge with a low median fold; parietal callus very thin or wanting. Alt. 7–9, diam. 14 mill.

St. Thomas, St. Johns, Tortola, Virgin Is.; Hayti.

H. nemoralina PETIT, *Guérins Mag. de Zool.* 1836, t. 80.—FER, *Hist.*, t. 29A, f. 1–3.—PFR. in *Conchyl. Cab.* t. 72, f. 19–21 and *Monogr.* i, p. 281.—REEVE, *Conch. Icon.* f. 293.

A well-marked from, allied to H. monodonta, but not strongly toothed on the basal lip, the margins of the peristome scarcely at all converging, and pink in color. The brown band is sometimes replaced by opaque white.

Var. INTENSA Pilsbry. Pl. 31, figs. 6, 7.

Shell more solid; opaque, whitish, tinged with purplish; upper whorls and apex deep purplish; last whorl deeply deflexed anteriorly; aperture smaller than in the type, peristome thickened within, deep pink. Alt. 9, diam. 14 mill.

H. DIAPHANA (Lamarck) Pfr. Pl. 11, fig. 8; pl. 19 figs. 51, 52.

Imperforate, globose-depressed, thin, translucent; light greenish yellow, smooth, shining, slightly marked by growth-lines; spire low-conical, a little obtuse; sutures but slightly impressed; whorls 4, slightly convex, the last wide, rounded, depressed, only slightly descending anteriorly, very deeply indented in the center of the base, forming a sort of "false-umbilicus" which is lined with a white deposit reflected from the columella. Aperture oblique, broadly lunar; peristome thin, very narrowly expanded on the outer and basal margins; columella nearly straight, oblique, thin, white, deeply inserted in the center of the axis. Alt. 9, diam. 14 mill.

Porto Rico; Viéque.

H. diaphana (LAM. *An. s. Vert.* vi, p. 85. ?) PFEIFFER, *Monographia*, i, p. 281; iii, p. 148—*Conchyl. Cab.* p. 45.—CHENU, *Illust. Conchyl.* iii, t. 8, f. 14.—REEVE, *Conch. Icon.* f. 1312.

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Sometimes has a narrow supra-peripheral zone of brown. Allied to H. nemoralina; but more diaphanous and thinner, more deeply indented in the center of the base, the columellar callus very white. The texture is similar to the thinner species of Fruticicola.

H. SANTACRUZENSIS Pfeiffer. Pl. 11, figs. 18–20; pl. 19, fig. 53, 54.

Imperforate, depressed, with low-conical or almost planulate spire, solid, whitish (when denuded of cuticle) with or without a narrow supra-peripheral brown zone; obliquely striatulate; whorls 4½ to 5, slightly convex, moderately increasing, the last wide, depressed, rounded at the periphery, flattened beneath, and indented around the axis; abruptly more or less deflected anteriorly, and either regularly rounded or gibbous behind the aperture; aperture broad-lunate, rather auriform, oblique; peristome sub-labiate, right margin slightly expanded, basal margin widened by an internal callus, rather broad, flat, subhorizontal, inserted in the center of the axis. Alt. 10, diam. 18 mill.; alt. 9, diam. 21 mill.

St. Croix.

H. santacruzensis PFR. *Malak. Bl.* 1855, p. 104, t. 4, f. 4–6; and *Monographia* iv, p. 235.

The typical form of this species is shown in figs. 18 to 20 of pl. 11. It is very variable in shape; the spire often is nearly planorboid, and the superior lip of the aperture strongly arched. The peripheral fascia is frequently absent; the young are narrowly umbilicate and carinate at the periphery. The following species is very closely allied. H. santacruzensis has been found only in a subfossil condition.

H. PHÆDRA Pfeiffer. Pl. 12, figs. 56–58; pl. 19, figs. 45–47.

Axis perforated, but covered in fully adult specimens; solid; depressed; spire low-conical; straw or "isabella" colored, with or without a narrow, chestnut supra-peripheral fascia; last whorl not gibbous behind the aperture, rather flattened and deflected there. Upper and lower margins of the peristome slightly and equally curved, subparallel; upper and outer margins simple, basal margin not thickened within (as H. santacruzensis is,) but its edge reflexed and adnate over the umbilicus and for a short distance on the base. The columella is not flattened or concave on its face as in H. santacruzensis. Alt. 10, diam. 21 mill.; alt. 11, diam. 18 mill.

Pto. Plata and Angostura Arriba, Hayti.

H. justi PFR. *Malak. Blät.* 1858, p. 149, t. 3, f. 4–6; and *Monog-*

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raphia v, p. 239.—*H. phædra* PFR. *P. Z. S.* 1852, p. 138; *Conchyl. Cab.* p. 477, t. 158, f. 16–18; *Monogr.* iii, p. 148.—REEVE, *Conch. Icon.* f. 768.

I can see no difference between H. phædra and H. justi of Pfeiffer. The figures 56–58 on pl. 12 represent the latter form.

Section III. HEMITROCHUS Swainson, 1840.

Hemitrochus SWAINS. *Shells and Shell-fish*, p. 331.—BINNEY and BLAND, *Ann. Lyc. N. H. of N. Y.* x, p. 342, 1873.—BINNEY *Proc. Phila. Acad.* 1874, p. 56; *Terr. Moll. U. S.* v, p. 174, 1878; *Ann. N. Y. Acad. Sci.* iii, p. 90,—PFR. *Mal. Blatt*, 1877, p. 8.—*Polytœnia* ALBERS–MARTENS *Die Heliceen*, 1860, p. 129.—*Polymita* (in part) ALBERS and other authors—*Phædra* (in part) ALBERS, *Die Heliceen*, 1850, p. 100.

A group of brightly painted species, mostly confined to the Bahamas. They are generally more globose and more opaque than the species of Cysticopsis or Plagioptycha.

The name of this section being older than Plagioptycha, Dialeuca, Coryda, etc., I have used in a wider sense to designate the group including all of these sections.

Most of the named forms of Hemitrochus of the Bahamas are only *incipient* species, not differentiated enough to have really tangible specific characters. I have examined very extensive suites, and finding the greatest difficulty in so defining the various forms that they may be separated into species, finally decided to point out the differences (where there are any) between the several species, varieties, races, or whatever the reader chooses to call the mutations, and leave the question of their rank open until we know positively to what extent actual coalescence occurs between the forms. I have made my descriptions *comparative*, as far as seemed desirable; and since *H. varians*, of the Florida Keys and New Providence is a species well-known to all conchologists, I have used it as a basis for comparison.

H. VARIANS Menke. Pl. 13, figs. 59–63.

Imperforate, except for a narrow chink behind the columellar lip, conical, solid, opaque, white or rose-tinted, unicolored or marked with spiral bands of brown, or suffused all over and streaked with chestnut, with or without spiral bands of white or dark; apex pink, purplish or white; surface marked slightly by growth-lines; spire

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elevated, conical, apex minute, sub-obtuse; whorls 5 to 5½, convex, the last deflexed anteriorly; aperture rounded-lunate, oblique; white or rosy within and showing the bands when there are any; peristome labiate within, straight, not expanded except on the baso-columellar margin, where it is reflexed and adnate above the umbilicus, with a callus plate within, which is generally truncate at base in adult specimens; columella and parietal wall crimson.

Alt. 17, diam. 16 mill.

Florida Keys and the Bahamas.

H. varians MENKE, (*Cat. Malsb*,p. 5) *teste* PFR., *Monographia* i, p. 238.—*Conchyl. Cab.* p. 221, t. 109, f. 105.—W. G. BINNEY, *Terr. Moll U. S.* iv, p. 51, t. 78, f. 22; *L. and Fr.*—*W. Sh.* i. p. 184.—*H. carnicolor* PFR. *Symbolæ* i. p. 37.—DESH. in FER., *Hist.* i, p. 205, t. 29A, f. 14–17.—REEVE, *Conch, Icon.* f. 283.—*H. subneris* MIGHELS *Proc. Bost. Soc. N. H.* 1844, p. 187.—PFR. *Monogr.* iii, p. 183.—*H. rhodocheila* BINNEY, *Terr. Moll.* i.—*H. polychroa* BINNEY. *Terr. Moll.* ii, t. 46, 47.—*Hemitrochus hæmastomus* SWAINS. *Malacol.*, p. 165, f. 19.—*Hemitrochus varians* W. G. BINN. *Manual Am. L. Sh.* p. 358. f. 389.

As in most species of Hemitrochus, the coloration is extremely variable. The species is abundant on the Florida Keys, and on New Providence, Inagua, Crooked Id. etc., of the Bahamas. Pfeiffer says also, "Porto Rico;" but this is probably erroneous.

H. MILLERI Pfeiffer. Pl. 32, figs. 39, 40.

This form belongs to the group of species immediately allied to H. varians, H. gallopavonis, etc.

Shell almost covered-perforate, depressed-conoidal, rather solid, opaque, white, marked with various arrangements of spiral bands and oblique streaks of varying shades of chesanut-brown; sometimes all brown except a white peripheral girdle; but the most attractive style of painting is shown by specimens of a light yellowish tint of chestnut, obliquely streaked all over with deep chestnut, and with or without black or white peripheral fascia. The spire is generally less elevated than in H. varians, and about the same as in H. gallopavonis which is a smaller, thinner species. Whorls about 5; apex obtuse, red or corneous. Surface densely, finely sub-costulate striate, the striæ deeper, more regular than in H. varians; body-whorl descending anteriorly; aperture rounded lunar, oblique; peristome in fully adult individuals labiate within, the outer and basal margins expanded slightly; columellar margin reflexed over,

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covering or almost covering the umbilical perforation; parietal wall and inside of aperture pink or not differently colored from the base.

Alt, 10–13, diam. 16–18 mill.

Long Cay, Fortune Id., Bahamas.

H. milleri PFR. *Mal. Blat.*, 1867, p. 126. and *Monographia* v, p. 233.

H. CONSTANTIOR Weinland. Pl. 12, fig. 34.

This form is generally smaller than H. varians; it has a decided tendency toward interruption of the spiral bands, and the whorl is very much more deeply deflexed anteriorly than in varians.

Imperforate or very nearly so; conical, compact, solid, opaque, shining, delicately striate, white, painted in numberless patterns with continuous and interrupted bands of deep and yellowish brown, narrow or broad, few or numerous, those above and below the periphery generally broken into spots or longitudinal streaks; sometimes unicolored, white; apex whitish, purple or rosy; spire elevated, whorls 5, slightly convex, the last globose, *very deeply deflexed anteriorly*; aperture rounded-lunar, very oblique, rather small, generally rosy and banded within; peristome scarcely labiate, margins converging, *right margin expanded*, white or colored, columellar margin reflexed, adnate over the umbilical perforation; parietal wall covered by a rosy callus, rarely white.

Alt. 10–13, diam. 14 mill.

Inagua, Rum Cay, Turk's Id., Crooked Id., Bahamas.

H. constantior WEINL. *Jahrb. d. Mal. Gesell*, vii, 1880, p. 371, t. 12, f. 19.

There is, of course, great variation in the banding and proportions of altitude to diameter. Note the italicised passages in the above description. The form is quite easy to recognize. There is no difference between the suites before me from several of the islands.

H. CARIBÆA Weinland. Pl. 20, figs. 69–71.

This shell resembles H. varians very closely in texture and coloration. It is imperforate, or has a slight umbilical fissure behind the columellar lip; the form is semiglobose or conoidal-elevated; not so conical as H. varians, and the body-whorl usually more depressed. It is solid, opaque, lightly striatulate, "brown fasciate with white, unicolored white, or multifasciate with brown." Whorls 4½, shaped like those of H. varians except the last, which is

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more depressed, and very slightly descending anteriorly, much less so than in H. varians. The peristome is slightly thickened within, sub-obtuse, not expanded except in the immediate vicinity of the umbilicus, where it is reflexed and adnate over the umbilicus. The columella is shaped as in H. varians, but is shorter, and although sometimes subdentate, is less calloused within. It is pink or white. Parietal wall generally pink.

Alt. 12–13, diam. 14–16 mill.

Crooked Id., Bahamas.

H. caribœa WEINL., *Malak. Blätt.* 1862, p. 196.—PFR., *Monographia* v, p. 238.

This form differs from H. gallopavoris in being heavier in texture, and in lacking the expansion of the basal and outer lips so characteristic of *really adult* specimens of that species. It is most nearly allied to H. varians, but differs as already indicated. Being unfigured, the species has been frequently wrongly identified, at least in American collections. Numerous specimens, including one from Dr. WEINLAND are before me.

H. GALLOPAVONIS Valenciennes. Pl. 31, figs. 17, 18.

This species is similar to H. varians in general form but usually the body-whorl is more depressed, the aperture more oblique, and the texture lighter, and thinner. The umbilicus is a narrow chink as in H. varians. The surface is more roughened by growth-lines than in H. varians, and the ground-color not so pure white, but generally slightly suffused with the color of the bands; apex dark, rosy or white; bands generally of a rich chestnut color, sometimes replaced by longitudinal streaks; rarely the shell is white. Aperture transversely oval-lunar, generally wider than in H. varians, (and usually wider than the figures show); bands showing within the aperture, but not so much upon the peristome as in H. varians. The outer and basal margins of the peristome are more expanded than in H. varians, in adult individuals.

Alt. 11, diam. 14 mill; Alt. 13 diam. 14 mill.

Turk's Id. (and St. Croix?).

H. gallopavonis VAL., PFR, *Symb.* ii, p. 28; *Monographia* i, p. 239; *Conchyl. Cab.* p. 223, t. 109, f. 12–13.—REEVE, *Conch. Icon.* f. 1207.

H. gallopavoris has much the same color-mutations as H. varians.

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VAR. CALACALOIDES Pilsbry. Pl. 31, figs. 24–26.

Conical; umbilicus as in H. varians and H. gallopavonis; peristome labiate, expanded, pink; color, white, of a chalky texture, scarcely shining; bands when present, whitish brown; last whorl much more rapidly widening than that of H. gallopavonis. Incremental lines rather irregular, just as in H. gallopavonis, not so strong as in H. troscheli; columellar lip concave; not straightened as in H. calacala. Apex pink or white. Alt. 13, diam. 15½ mill.

Ambergris Cay. Turk's Id. group.

H. TROSCHELI Pfeiffer. Pl. 13, figs. 64–67; Pl. 20, figs. 59–64.

A form allied to H. gallopavonis in texture, form and coloration, but more strongly striate, and having a decidedly more broadly expanded peristome with a stronger thickened rib within.

Perforate, depressed conico-globose, rather thin, opaque, painted in innumerable patterns with chestnut, yellowish, deep brown or pinkish-brown spiral bands or longitudinal streaks or unicolored, the apex generally pinkish. Surface costulate striate, shining; spire elevated or depressed, apex minute, slightly obtuse, smooth; sutures impressed; whorls 4½ to 5, slightly convex, the last wide, depressed, often obsoletely carinated in front of the aperture, rather deeply deflexed anteriorly, slightly constricted behind the basal part of the peristome; aperture rounded-lunar, quite oblique, showing the bands within; peristome brown, pink or white, strengthened by a strong rib within; its margins converging; outer and basal margins rather broadly expanded; baso-columellar margin more oblique than in H. gallopavonis, less concave, generally somewhat straightened, more thickened within, sometimes with a tiny notch or truncation at the base of the columellar callus; at its insertion the lip is reflexed over and partly conceals the umbilicus, which is generally wider than in H. galiopavonis. The parietal wall and aperture generally is not so deeply stained with pink as in H. varians, etc. Measurements of four specimens are as follows:

Alt. 12, diam. 16 mill; Alt. 12, diam. 14 mill.; Alt 10, diam. 15 mill.; Alt. 9, diam. 11 mill.

New Providence, Bahamas.

H. troscheli PFR. *Symbolæ* iii, p. 76, (1846); *Conchyl. Cab.* p. 222, t. 109, f. 6–11.—REEVE, f. 289.—*H. calacala* WEINL. *Jahrb. d. mal. Gesell,* vii, 1880, p. 374, t. 12, f. 21.—*H. tenuicostata* DUNKER, in PHILIPPI, *Abbild.*, ii, p. 32, t. 6, f. 13.—PFR. in *Conchyl. Cab.* t. 109, f. 14, 15; *Monogr. i,* p. 335.—REEVE, f. 1224.—CROSSE ET FISCHER, *Moll. Mex. et l'Amer. Cent.*, p. 298.

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The H. tenuicostata does not seem to present any tangible points of difference from H. troscheli. The original figures are copied on my pl. 32, figs. 53–55. The original description (translated) is as follows:

Shell perforate, depressed-globose, rather solid, obliquely costulate-striate, white, with many brown bands; spire elevated, wide-conical; whorls, 4½, slightly convex, sensibly increasing, the last deflexed anteriorly, aperture lunate-oval; peristome acute, labiate within, right lip subexpanded, columellar margin reflexed, dilated, appressed, nearly covering the umbilicus. Alt. 8, diam. 13 mill

Mexico.

Crosse and Fisher (*loc. supra cit.*) discredit the occurrence of the species in Mexico.

The *H. calacala* of Weinland seems to be included in the range of variation of the present form. I have examined several hundred specimens and find numerous transition forms. The shell is sometimes small, solid, compact, globose, with very round aperture and concave columella; sometimes large, depressed, conical, with wide aperture and oblique, straight columella. White examples are usually touched with pink on apex and mouth. Although H. troscheli is usually more widely umbilicated than H. gallopavonis, I have seen nearly imperforate examples. Figs. 59–61 of pl. 20, are drawn from specimens named by DR. PFEIFFER.

VAR. CALACALA Weinland. Pl. 12, figs. 38, 39.

Subimperforate, conoidal, closely costulate-striate, pinkish-white; spire elevated; whorls 5½, somewhat convex, the last descending; aperture diagonal, lunate-circular; peristome labiate within, expanded, columellar margin rosy, dilated, reflexed.

Alt. 13, diam. maj. 19, min. 17 mill. (*Weinland.*)

New Providence.

A variety like calacala in the light color, solidity, and nearly imperforate base, but with strong, distant costulæ on the surface, and attaining only about 15 mill. diam., is before me.

VAR. BROWNII Pilsbry. Pl. 31, fig. 27.

Depressed, thin, *carinated*, subimperforate, strongly, densely, costulate; whorls 4½, the apex slightly prominent; peristome expanded, color brown above, with a darker supra-peripheral line; base whitish. Alt. 7–8, diam. 13 mill.

Cat Island, Bahamas. (*legit* DR. J. J. BROWN.)

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H. MULTIFASCIATA, Weinland et Martens. Pl. 31, figs. 30–32.

The preceding species is related to this form, but the broadly reflected lip, transverse, oval aperture and wider umbilicus will separate *H. multifasciata* from all of its allies.

Umbilicate, depressed, moderately solid, slightly shining, whitish or pink-tinged above, encircled by several or many (4–10) brown bands, frequently interrupted into series of flecks; densely costulate-striate; spire low, apex brownish or corneous, minute; sutures slightly impressed; whorls about 5, slightly convex, the last wide, depressed, rounded at the periphery, very deeply deflexed anteriorly, rather flat beneath, and indented around the center of the base; aperture very oblique, transverse oval, brown or dark vinous within; peristome broadly expanded in every part, white or radiately maculated by the continuation of the bands to its edge; the margins converging, joined by a thin callus; columellar margin reflexed, partly concealing the umbilicus, concave, slightly callus within, with generally a purplish or brown spot at the insertion.

Alt. 10 diam. 18 mill.

Crooked Island, Bahamas.

H. multifasciata WEINLAND ET MART. *Malak. Bl.* 1859, p. 17.—PFR. *Monographia* v, p. 353.

VAR. POLYTÆNIATA Pilsbry. Pl. 31, fig. 29.

Narrowly umbilicate, solid, conical, less striate than H. multifasciata; white, the bands, except the peripheral, interrupted by broad patches of white; apex, parietal wall and columella purplish pink; columella with a strong tooth-like fold of callus. Differs from H. multifasciata in the elevated form and columellar denticle.

Alt. 16, diam. 18 mill.

H. FILICOSTA Pfeiffer. Pl. 11, fig. 17.

Nearly covered perforate, depressed-globose, regularly costate (costæ filiform), rather thin, fleshy white, encircled with obsolete brown lines; whorls 4½, convex, the last deflexed anteriorly; aperture lunate-circular; peristome acute, thickened within, labiate, margins converging, joined by an entering rosy callus; right margin scarcely expanded, columellar margin dilated, reflexed, rosy.

Alt. 9, diam. maj. 14, min. 13 mill. (*Pfeiffer.*)

Eleuthera, Bahamas.

H. filicosta PFR. *P. Z. S.* 1845, P. 73; *Monographia* i, p. 239.—J. H. THOMPSON—*P. Z. S.* 1885, p. 214.—REEVE *Conch. Icon.*, f. 1437.

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The upper surface bears fine, regular costæ. The species seems distinct from others. The locality was unknown until Mr. Thompson, of New Bedford, Mass., received it from a small key lying near the North end of Eleuthera.

* * *

H. GILVA Férussac. Pl. 11, figs. 5–7.

This species heads a series of forms distinct from all of the preceding species, but very closely related to one another. In this series, as in that of H. gallopavonis, etc., the species are founded upon characters of but slight importance, while the variations in each of them seem to leave no lacunæ in the succession of forms. We find that in Hemitrochus, as some one has neatly said of the distinctions in another department of zoölogy, "size and form count for very little, and coloration for nothing at all." I am content to point out such differences as I can see between the forms, leaving each individual student to decide for himself their claims to specific rank.

Narrowly umbilicate, depressed-globose, thin, shining, white or tinged with yellowish or pinkish, encircled by numerous narrow blackish and brown bands, several of them generally continuous, the others interrupted; surface coarsely striate; spire low, rather obtuse; apex minute; sutures moderately impressed; whorls 4½, the last wide, depressed, rounded at the periphery, rather deeply deflexed anteriorly; aperture oblique, broad oval-lunar, showing the bands within; peristome expanded, rather thin, slightly labiate with brown within, margins converging; columella broadly reflexed, partly concealing the umbilicus, brown or purplish; umbilicus narrow, showing a slight spiral furrow within, when not too much covered.

Alt. 10, diam. 15 mill. *Jurisdiction of Trinidad, Cuba.*

H. gilva FER., *Hist.* t. 21A, f. 1. and *Prodr.* 36.—D'ORB., (in part) *Moll. Cuba*, t. 8, f. 9–12.—PFR., *Conchyl. Cab.* p. 340, t. 60, f. 9–12; *Monographia* i, p. 335.—ARANGO, *Fauna Mal. Cub.* p. 77—*H. corrugata* PFR. *Symb.* i. p. 41.—(*H. pallida* RANG, teste Arango) —*H. tephrites* MORELET, *Test. noviss.* i, p. 8.—PFR., *Mongr.* iii p. 80.

The bands are sometimes coalesced into two continuous broad zones, leaving a white peripheral girdle. The more prominent characters are the depressed form, the bands, part of them continuous.

Var. TEPHRITES Morelet. Pl. 31, figs. 22, 23.

Smaller, more globose and more sharply striate than the type,

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with a continuous blackish peripheral fascia and a number of brown spiral bands. Alt. 9–10, diam. 12 mill.

Trinidad, (and Baracoa?) Cuba.

H. LUCIPETA Poey. Pl. 20, figs. 72–78, 80, 81.

Subimperforate, globose-depressed, thin but strong, smoother than H. gilva, the incremental wrinkles not conspicuous; surface polished, bright and shining all over; spire low, frequently with a very obtuse appearance, color yellowish or fleshy-white, densely longitudinally marked with narrow brown stripes, which are broken into spiral series or girdles by numerous revolving white zones. There are no continuous spiral color bands as there are in H. gilva. Whorls 4½, convex, apex minute, corneous, suture impressed; last whorl wide, rounded at the periphery, more globose than it is in H. gilva, somewhat deflexed anteriorly, rather tumid around the umbilicus, subconstricted behind the aperture on the base; aperture oblique, round-lunar, generally brown, banded with white within; peristome very narrowly expanded, only a trifle if at all labiate; columella margin almost covering the narrow umbilicus by a triangular reflection usually pinkish in color; terminations of the peristome somewhat approaching. Alt. 9–10, diam. 13–14 mill.

Trinidad, Manzanillo, Guantanamo and Bayamo, Cuba.

H. picturata POEY, *Memorias*, i, p. 209, 212, t. 26, f. 1–5. (not of Ad.)—*H. lucipeta* POEY, *l. c.* p. 447; ii, p. 51. (1857?)—PFR. *Monogr.*, iv, p. 265.—ARANGO, *Fauna Mal. Cubana* p. 76.—*H. lepida* POEY, *Mem.* i, p. 209, 212, t. 26, f. 6–10. (preoc.)—*H. bellula* POEY, *Mem.* ii, p. 7.—PFR. *Monogr.* iv, 264.—*H. penicillata* POEY, *Mem.* ii, p. 27, t. 1, f. 6–10 (not of Gould)—*H. newcombiana* POEY, *Mem.* ii, p. 28.—*H. velasqueziana* POEY, *Mem.* ii, p. 28, t. 1, f. 1–5.

The description above is drawn from specimens received from the author. Some shells are nearly as depressed as H. gilva; but none are as widely umbilicated as typical examples of that species.

Var. VELASQUEZIANA Poey. Pl. 20, figs. 80, 81.

Smiliar in form to lucipeta or more depressed; lip white or tinted; color-markings coalescent into two broad dark continuous bands; subsutural and peripheral white zones articulated with narrow dark streaks as the same tracts are in H. lucipeta.

I am not sure that my shells (figs. 72, 73) are the same as Poey's H. velasqueziana. His figures are copied on my plate 20, figs. 80,

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81. At all events, both his form and my darker one are only varieties of H. lucipeta.

Var. CESTICULUS Gundlach. Pl. 20, figs. 65, 66.

Typically distinguished from H. lucipeta by the stronger striation and generally more depressed form. The coloration varies from uniform whitish or isabella-colored, to deep chestnut or purplish brown, with white subsutural and peripheral zones. The more usual pattern consists of numerous girdles of brown streaks and spots, on a white or yellowish-brown ground. The following description is a translation of Pfeiffer's:

Very narrowly, almost covered umbilicate, globose-depressed, rather thin, obliquely, densely costulate-striate, scarcely shining, whitish or flesh-tinted, variously painted with undulating or interrupted brown bands, rarely nearly unicolored; spire shortly convex-conoid; whorls nearly 5, somewhat convex, the last rounded, anteriorly deflexed; aperture very oblique, lunate-oval; peristome pale rose-colored, sub-thickened within, the margins converging, right margin briefly expanded, columellar margin declivous, dilated upward, reflexed. Alt. 7⅓–9½, diam. maj. 12⅓–17 mill.

Santiago de Cuba, Holguin, and Guantanamo.

H. cesticulus GUNDL. in PFR., *Malak. Bl.* 1858, p. 179.—*Monogr.* v, p. 348.

The variations of this form seem to connect H. gilva and H. lucipeta.

H. PENICILLATA (Gould) Pfr. Pl. 32, figs. 50–52.

Perforate, globose-depressed, rather solid, closely striate, shining, fleshy-white, ornamented with narrow bands of brown dots; spire convex, obtuse; whorls 4½, slightly convex, the last rounded, descending anteriorly; aperture diagonal, rotund-lunar; peristome subsimple, margins subconverging, right lip briefly expanded, columella lip reflexed, flesh-colored. Alt. 9, diam. 15 mill. (*Pfeiffer.*).

Cuba.

H. penicillata (GLD. *Bost. Journ. N. H.* 1842 ?)—PFR. in *Conchyl. Cab.* p. 422, t. 129, f. 3–5; *Monogr.* iii, p. 226.

This description and the figures are from Pfeiffer, and may or may not be applicable to the *H. penicillata* of Gould. Cuban naturalists know nothing definite about the form, and it might be put among the unidentifiable species with advantage. Gould's diagnosis is as follows:

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"T. subglobosa, fragili, lucida, lævigata, infra convexa, anfr. 4; ornatis vel lineis longitudinalibus interruptis diversissime fasciata; labro acuto; columella antice roseo-tincta. Long. 0.35, lat. 0.25 poll."

The H. NÆVULA of Morelet is another closely allied form of which I know nothing beyond the information contained in the original diagnosis, which is as follows:

T. subglobosa perforata, minute striata, pallide fulva, tenuis, lineolis punctiformibus creberrimo adumbrata, maculisque violaceis irregularibus picta; anfr. 4½, ultimus dilatatus, aperturam rotundatum formans; perist. simplex, acutum, margime columellari umbilicum semitegente.

Diam. maj. 15, min. 12 mill. (Test. noviss. i, p. 7.)

Baracoa, Cuba.

H. COMTA Gundlach.

Perforate, conoid-subglobose, thin, minutely striatulate, cretaceous, ornamented with a single peripheral blackish-brown subdenticulate fascia and numerous interrupted chestnut streaks; spire conoidal, obtuse; whorls 4½, rather convex, the last rounded, briefly descending anteriorly; aperture oblique, lunate-rounded; peristome thin, right margin slightly expanded, columellar margin dilated above, reflexed, nearly covering the very narrow umbilicus.

Alt. 10, diam. maj. 14, min. 12 mill. (*Pfr.*)

Cabo Cruz, Cuba.

H. comta GUNDL. in PFR., *Mal. Blät.* 1857, p. 172.—PFR. *Monographia* iv, p. 266; v. 348.

Known to me only by the original description translated above.

H. FUSCOLABIATA Poey. Pl. 32, figs. 61, 62.

Narrowly perforate or subimperforate, depressed-globose, thin but not fragile, opaque, whitish, tinged with brown or flesh-color, encircled by numerous or few narrow girdles of brown dots or short streaks, sometimes unicolored; surface marked by incremental lines, but polished, bright and shining all over; spire low; whorls 4½, slightly convex, the last depressed, rounded, deflexed anteriorly; aperture oblique, round-lunar; peristome straight or a trifle expanded, *labiate within with deep chestnut and bordered outside with the same*, margins converging, basal margin narrowly expanded, columellar margin reflexed, nearly concealing the umbilicus, dark brown; parietal wall with a very thin transparent callus.

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Alt. 9–10, diam. 12½–14 mill.

Manzanillo, Santiago de Cuba, Bayamo, Guantanamo and Holguin, Cuba.

H. subfusca POEY, *Memorias* i, p. 210, 213, t. 26, f. 11–15. (not of Beck)—PFR. *Mal. Bl.* 1854, p. 183—*H. fuscolabiata* POEY, Mem. ii, p. 29.—PFR. *Monographia* iv, 348—ARANGO, *Fauna Mal. Cubana*, p. 77.—*H. morbida* MORELET, *Test. noviss.* i, p. 8.—PFR. *Zeitschr. f. Mal.* 1852, p. 179, t. 1, f. 43–45; *Conchyl. Cab.* t. 158, f. 28–30.—REEVE, *Conch. Icon.* f. 974.

This is quite a distinct form. The very dark lip will separate it from the preceding.

Var. MORBIDA Morelet. Pl. 12, figs. 53–55.

A smaller, thinner, were diaphanous shell than the type, pale corneous or flesh-colored, with broad whitish zones at suture and periphery. Alt. 7, diam. maj. 12 mill.

Baracoa and Nuevitas, Cuba.

H. MACULIFERA Gutierrez. Pl. 13, figs. 69–71; pl. 31, fig. 28.

Subimperforate, small, globose-depressed, thin but rather solid, glossy and shining all over, very delicately striate, opaque, white, with two peripheral narrow brown bands, or sometimes flesh-tinted or brownish, with a white zone at the periphery, *the body-whorl irregularly speckled with large dots of dark transparent brown;* spire low, apex obtuse, whorls 4–4½, the inner ones translucent corneous, not variegated, the last depressed-globose, with a mere suggestion of being angulated in front of the aperture, quite gibbous beneath around the umbilicus, deeply deflexed anteriorly; aperture very oblique, small, transverse-oval, truncated, brown and showing spots within; peristome white, margins converging, outer and basal margins narrowly expanded, columellar margin reflexed, concealing the umbilicus except a narrow chink. Alt. 8–9, diam. 10–12 mill.

Santa Cruz, Cuba.

H. maculifera GUT. in POEY, *Memorias* ii, p. 28, t. 2, f. 1–5—PFR. *Monogr.* iv, p. 265.

The figures on pl. 13 are about double natural size. The color-pattern and deep deflexion of the last whorl will separate this form from all others.

H. AMPLECTA Gundlach. Pl. 32, figs. 33–35.

Narrowly, openly umbilicate, depressed, thin, closely costulate-

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striate, pale corneous, with two narrow deep brown bands around the periphery, bounding a median corneous or whitish zone, and sometimes a wider, fainter brown band on the middle of the upper surface; spire low-conoidal, apex slightly obtuse, minute, smooth, light corneous; sutures moderately impressed; whorls 4½, moderately widening, the last rapidly widening, depressed, rounded at the periphery, deflexed anteriorly; aperture very oblique, transverse-oval, somewhat truncated by the parietal wall; peristome thin, slightly expanded, the columellar margin white, much dilated above, a triangular reflection partially concealing the umbilicus.

Alt. 9, diam. 15 mill.; alt. 10, diam. 14 mill.

Nuevitas and Punta de Maisi, Cuba.

H. amplecta GUNDL. in PFR., *Mal. Bl.* 1860, p. 17; 1866, p. 56; *Monogr.* v, p. 349.

Sometimes all color-markings except a single brown peripheral line are absent. The aperture is very wide, transverse-oval; and the general aspect of the shell is quite different from that of the group of H. gilva, etc.

H. RUFOAPICATA Poey. Pl. 20, figs. 67, 68.

Openly umbilicate, depressed, thin but rather solid, densely striate, but smoother than the preceding species, light liver-colored, with a white zone below the suture and another at the periphery, the latter bordered on each side by deep-brown lines; apex reddish; whorls 4½, the last wide, deflexed anteriorly; aperture oblique, transverse-oval; peristome slightly labiate with brownish within, margins converging, outer and basal margins slightly expanded, columellar margin dilated partly over the umbilicus, brownish; umbilicus expanded, grooved or rugose within. Alt. 9–10, diam. 13–15 mill.

Holguin and Jibara, Eastern Cuba.

H. rufoapicata POEY, *Memorias* ii, p. 29.—PFR. *Monogr.* iv, p. 266.—*H. gilva var.* PFR. *olim*, and REEVE, f. 252a.

This shell is more solid than H. amplecta, and the color bands are clear and well-defined.

H. GRAMINICOLA C. B. Adams. Pl. 32, figs. 36–38.

This form is intermediate between H. amplecta and H. rufoapicata. The sculpture and coloration are the same as in the latter species, except that the white peripheral zone is margined by a dark line only upon the upper side, the subsutural white band is narrow-

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er, sometimes scarcely visible, and the apex is corneous, not reddish. The umbilicus is not so much expanded as in H. rufoapicata.

Alt. 9–10, diam. 13–15 mill.

Jamaica.

H. graminicola C. B. Ad. *Contr. to Conch.* ii, p. 32, (1849.)—*H. gilva var.* Pfr., *Monographia.*

Pfeiffer is in error in referring this form to H. gilva Fér. Its affinities are with H. rufoapicata Poey. In this trio of pretty little species, *graminicola rufoapicata, amplecta,* the coloration is comparatively constant. I have two trays of specimens from Cuba which show a partial coalescence of the characters of graminicola and rufoapicata. The latter form may finally rank as a variety of the former.

H. sauvallei Arango.

Perforate, depressed-globulose, thin, striate, corneous; spire convex-conoidal, apex minute; whorls 4, rather convex, the last large, rounded, somewhat descending anteriorly; aperture oblique, lunar-rounded; peristome simple, margins sub-converging, right lip slightly expanded, columellar lip dilated above, with an arched reflection.

Alt. 7½, diam. maj. 11, min. 9½ mill. (Pfeiffer.)

Baracoa, Cuba.

H. sauvallei Arango in Pfr., *Mal. Blät* 1866, p. 58; *Monogr.* v, p. 323.—Arango, *Faun. Mal. Cub.* p. 75.

Known to me only by the above diagnosis.

H. depicta Grateloup. Pl. 13, f. 68.

Imperforate, subglobose, conoidal, thin, white, very delicately striate, painted with bands and varied lines of yellowish-brown, interrupted; lip simple, acute.

This pretty shell has a certain resemblance to *H. pisana* Müll., but it is a little smaller and not umbilicated. The inside edge of the right lip is white instead of rose. The upper surface is covered with numerous more or less deep yellowish brown transverse bands, interrupted by oblique lines of the same color. Five whorls of the spire convex. Alt. 11, diam. 15 mill. (*Grateloup!*)

"*Ins. St. Thomas; New Orleans,*" (Grat.)

H. depicta Grat. *Actes Soc. Linn. Bord.* xi, p. 399, t. 1, f. 12. 1839.—Pfr. *Monogr.* i, p. 27.

It is impossible to tell what this shell is. It does not exist at

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New Orleans, nor has it been found at St. Thomas by modern conchologists.

H. VARIEGATA Chemnitz. (PFR. *Monogr.* i, p. 174; *Conchyl Cab.* p. 52, t. 6, f. 10, 11,.—*H. nævia* GMEL. *Syst.*, xiii, p. 3623.)

This is a spurious species, which need not encumber our catalogues any longer. Chemnitz was not a binomialist in vol. ix of the "Conchylien Cabinet." The species has never been identified by any one that I have ever heard of.

Section IV. DIALEUCA Albers, 1850.

Dialeuca ALB. *Die Heliceen*, 1850, p. 114.—*Coryda* (in part) ALBERS–MARTENS, *Die Heliceen* 1860, p. 136.—*Leptoloma* ALBERS–MARTENS, *Die Heliceen* 1860, p. 167.

In the West Indian Helices, as in nearly every department of zoology, there is a large excess of subgeneric names over the number of natural groups. Our course in this case is plain. We must accept *Dialeuca* (type, H. nemoraloides), and reduce the later name, *Leptoloma*, (type, H. fusco~~fabris~~ fincta Ad) to a synonym; for there is absolutely no character of more than specific value to separate the species of the two divisions. Albers seems to have decided to unite Dialeuca to Coryda, (Die Heliceen 2d ed, p. 136), but although there is no difference of any importance to speak of, we may as well retain the division, as it is a natural one, even though the characters are trivial.

H. CONSPERSULA Pfeiffer. Pl. 18, figs. 12–14.

Imperforate, conical, thin, striate, nearly lustreless, varying in color from yellowish to dark brown, with or without two dark zones on the body-whorl, all over more or less densely dotted with whitish flecks; spire elevated, conical, apex obtuse, smooth, shining, the tip blackish; sutures moderately impressed; narrowly margined with a deep brown line, which is usually dotted with white; whorls 6, the last depressed, wide, generally subangulate at the periphery, not deflexed anteriorly, or only slightly so; aperture quite oblique, broad, peristome thin, brown, outer and basal lips slightly expanded, columella nearly vertically entering, somewhat thickened; parietal wall with a slight callus which extends also around the umbilical tract. Alt. 16, diam. 20 mill; Alt. 15, diam. 23½ mill.

Jamaica.

H. conspersula PFR. *P. Z. S.* 1845, p. 124; *Monographia*, i, p. 230; *Conchyl. Cab.* p. 327, t. 136, f. 1, 2.—PHILIPPI *Abbild.* ii, p. 84, t.

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7, f. 4.—REEVE, *Conch. Icon.* f. 433.—*H. fuscocincta* C. B. Ad. *Contr. to Conch.* iii, p. 34, (1850)—PFR. in *Conchyl Cab.* p. 218 t. 108, f. 11, 12; *Monogr.* i, p. 30.—REEVE, *Conch. Icon.* f. 291.—*H. virginea* C. B. Ad., *Contr. to Conch.* iii, p. 33.—PFR. *Monogr.* iii, p. 149.—*H. platystyla* PFR. *P. Z. S.* 1849, p. 130; *Monogr.* iii, p. 174. —REEVE *Conch. Icon.* f. 487.—BLAND, *Ann. Lyc. Nat. Hist.* N. Y., xi, p. 82.

So great is the variation shown by the numerous specimens of Leptoloma before me that I do not hesitate to unite under the oldest name most of the described species. I have seen creamy-white examples of conspersula, without markings.

Restricting typical H. CONSPERSULA to shells of light texture and color, not prominently banded but conspicuously dotted with whitish, the spire only moderately elevated, we may define the following divergencies from this type, ranking them as varieties.

VAR. FUSCOCINCTA C. B. Ad. Pl. 18, figs. 4–6.

Spire more elevated, elate-conic; striatulate or densely, finely costulate-striate; the base, a supra-peripheral zone and a subsutural line dark; whorls of the spire with a median dark band; white flecks few or none.

Alt. 23, diam. 19–22 mill.; Alt. 19, diam. 22 mill.

Jamaica.

VAR. PLATYSTYLA PFR. Pl. 18, figs. 3, 7.

Form the same as typical conspersula; body-whorl inclined to be angular at the periphery; surface striate, somewhat shining; *thicker, solider*, than the preceding forms, with a bright white lining inside; spiral bands obsolete except the subsutural marginal line; color yellowish, more or less strigate obliquely with light chestnut; lip brown-edged; columella pinkish-brown, umbilical tract covered with a brown or violet callus.

Alt 19, diam. 22 mill. Alt. 19, diam. 24 mill.

Jamaica.

VAR. VIRGINEA C. B. Ad.

Conic; pale brown, with the upper whorls and a zone on the periphery horn-colored, with narrow portions of epidermis scattered somewhat in zigzag, which are white and hydrophanous; with fine striæ of growth; spire elevated, with nearly rectlinear outlines; spire rather obtuse; whorls nearly 6, a little convex, with the suture but

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little impressed; last whorl much advanced above over the aperture which is suborbicular; lip very thin and sharp, except the columellar portion, which is much thickened and expanded, of a pink color, coalescing with the outer lip in a curve. (*Adams.*)

Jamaica.

H. SUBCONICA C. B. Adams. Pl. 18, figs. 15, 19; pl. 20, fig. 79.

Imperforate, yellowish, depressed conoidal, thin, subtranslucent, irregularly striate, marked with narrow pheripheral and subsutural bands, and a circular chestnut tract around the axis, surrounded by a lighter zone; frequently longitudinally streaked with chestnut; spire low-conic; apex corneous or dark; whorls 5, slightly convex, regularly increasing, the last depressed, subangular at the periphery, a mere trifle descending anteriorly; aperture transverse, wide, oblique; peristome thin, white, outer and basal margins expanded somewhat; columella reflexed, white; parietal callus transparent, very thin. Alt. 14, diam. 21; Alt. 15, diam. 18; Alt. 12½ diam. 19 mill. *Jamaica.*

H. subconica C. B. Ad. *Proc. Bost. Soc. N. H.* 1845, p. 15.—PFR. *Monogr.* i, p. 30; *Conchyl. Cab.* t. 108, f. 15–16.—REEVE, *Conch. Icon.*, f. 284.—*H. gossei* PFR. *P. Z. S.* 1846, p. 37; *Monographia* i, p. 30; *Conchyl. Cab.* t. 108, f. 16. (not of Adams.)

A darker form than that described above is figured on pl. 18, fig. 19. There is besides a smaller form, light corneous or yellowish in color, with very narrow bands, sometimes unicolored, very thin.

Alt. 11–12, diam. 15–16 mill.

H. NEMORALOIDES C. B. Adams. Pl. 14, figs. 96–98.

Resembles H. subconica, but is more solid, more compact, more opaque, and has more numerous bands.

Imperforate, depressed-conoidal, rather solid, slightly shining, opaque, white or slightly suffused with brownish, generally more or less streaked longitudinally with light chestnut, and encircled by deep brown or blackish bands, generally three in number, in addition to a subsutural brown line and a circular axial patch; spire conical, low, apex obtuse, dark; sutures but slightly impressed; whorls 5, the last rounded at the periphery, *briefly but obviously descending anteriorly*; aperture broad, transverse, oblique; peristome thin, outer lip slightly expanded, columellar margin oblique, rather wide, flat, appressed at the umbilical region.

Alt. 11–13, diam. 17–19 mill. *Jamaica.*

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H. nemoraloides C. B. Ad. *Proc. Bost. Soc. N. H.* 1845, p. 15.—Pfr. *Zeitchr f. Mal.* 1845, p. 155; *Conchyl Cab.* p. 218, t. 108, f. 5, 6; *Monogr.* i, p. 230.—Reeve, f. 273.—*H. gossei* C. B. Ad. (in sched. Mus. Cuming) Pfr. in *Conchyl. Cab.* p. 220, t. 108, f. 19, 20; *Monogr.* iii, p, 176.—Reeve, *Conch. Icon.* f. 288.—*H. pulchrior* C. B. Ad., *Contr. to Conch.* no. 9, p. 172 (1851).

The extensive suite before me proves conclusively the specific identity of the forms I have included in the synonymy.

The above description applies more especially to the variety known as *H. gossei* Ad. (pl. 18, figs. 9–11). The *H. pulchrior* Ad. (pl. 18, fig. 8,) is a variety with numerous longitudinal chestnut-brown streaks.

Typical *H. nemoraloides* may be separated from the color-variety *gossei*, by its whiter surface, with very distinct, dark or blackish bands, generally narrow, and three in number. *There is no umbilical dark patch* (and by this character alone, true nemoraloides may always be known). The three zones are sometimes confluent into one or two. The whole surface is sometimes faintly suffused with brownish or yellowish, but never longitudinally streaked.

H. jacobensis C. B. Adams.

Depressed conical, transversely ovate; yellowish horn color, with very fine, well-impressed crowded striæ of growth; spire with the outlines but little convex; whorls 4½ to 5, a little convex with a moderately impressed suture; last whorl sub-angular; aperture transversely ovate, laterally dilated; lip but little reflected and thickened except in the columellar part, which is well thickened, reflected and appressed; umbilicus wanting. In form this shell most resembles a very depressed *H. fuscocincta*, but is much more dilated laterally near the aperture. (*C. B. Ad.*)

Alt. 15, diam. maj. 23½ min. 16 mill.

St. James Parish, Jamaica.

H. Jacobensis C. B. Ad. *Contr. to Conch.* no. 9, p. 172 (1851.) Pfr. *Monogr.* iii, p. 176.

I know this species only by the above description.

H. blandiana C. B. Adams. Pl. 18, fig. 18; pl. 32, figs. 45–47.

Imperforate, depressed, rather thin, shining, somewhat translucent, densely, regularly, finely costulate-striate; color pale corneous, streaked obliquely with light chestnut; spire low-conical, apex reddish, minute, obtuse; suture moderately impressed; whorls 5, *very*

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gradually widening, slightly convex, the last scarcely deflexed anteriorly, obtusely sub-angular at the periphery; flattened beneath; aperture oblique, transverse; peristome thin, margins scarcely converging, outer and basal lips slightly expanded, columellar margin white, very oblique, nearly straight, flat, thickened somewhat within, inserted in the center of the axis.

Alt. 10, diam. 16; Alt. 8½, diam. 17 mill.

Jamaica.

H. blandiana, Ad. *Contr. to Conch.* no. 7, p. 107.—REEVE, *Conch. Icon.* f. 303.—PFR. *Monogr.* iii, p. 193.

The gradual increase of the whorls is the most notable feature of this shell.

H. PHÆOGRAMMA, Pfeiffer. Pl. 18, figs. 16–17.

Covered perforate, orbicularly convex, shining, rather glabrous, with radiating rich chestnut lines above and a castaneousfascia on the base; whorls 4½, scarcely convex, the last obsoletely angulated, base rather flattened; aperture very oblique, rotund-lunar; peristome labiate with chestnut within, margins converging, upper margin a little expanded, basal dilated, reflexed, appressed.

Alt. 8½, diam. maj. 15, min. 12½ mill.

Habitat unknown.

H. phæogramme PFR. *Symbolæ* iii, p. 72, (1846); *Monographia* i, p. 285.—REEVE, *Conch. Icon.* f. 299.

Known to me only by the above description and Reeve's figures.

Section V. CORYDA Albers, 1850.

Coryda ALB. *Die Heliceen* 1850, p. 100.—H & A. Ad., *Gen. Rec. Moll.* ii, p. 198.—and of authors generally.—*Histrio* PFR. *Mal. Blat.* 1855, p. 185; *loc. cit.* 1877, p. 8.—PFEIFFER-CLESSIN *Nomenclator*, p. 159, 1881.

Coryda consists of snails essentially similar to Dialeuca, differing in the heavier shell, abruptly deflexed whorl at the aperture, and more varied coloration. The type is H. alanda Fer. *Histrio* of Pfeiffer is completely synonymous; for H. dennisoni, its type, is barely specifically distinct from H. alauda.

H. ALAUDA Ferussac. Pl. 16.

Imperforate, globose-depressed or conoidal, solid, heavy, strong, opaque, somewhat shining, slightly irregularly marked by growth lines; color very mutable, (see below); spire depressed, dome-shaped

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or elevated, conoidal, apex obtuse, sutures well marked; whorls 5, slightly convex, moderately widening, the last more or less depressed, rounded at the periphery, rather flattened beneath, abruptly more or less deeply deflexed anteriorly; aperture very oblique, wide oblong, truncate; peristome strong, labiate within, its margins but slightly converging; outer lip sub-expanded; baso-columella lip broad, white, flat, thickened within, inserted in the center of the base; *parietal wall the same color as the base.*

Alt. 17, diam. 21 mill.; alt. 13, diam. 23 mill.; alt. 11, diam. 16 mill.

Eastern Cuba.

H. alauda FER. *Hist.*, t. 103, f. 2, 3,; *Prodr.* 319.—PFR. *Monogr.* i, p. 268; v, p. 303; *Conchyl Cab.* t. 71, f. 12.—d'ORB. *Moll. Cuba*, i, p. 149, t. 9, f. 8–10.—REEVE, f. 261.—ARANGO, *Fauna Mal. Cubana* p. 72.— *H. strobilus* FER., *Prodr.* 317, *Hist.* t. 103, f. 1.—PFR. *Symb.* iii, p. 72; *Conchyl. Cab.* t. 72, f. 22, 23.—REEVE, f. 580.—*H. mamilla* LEA, *Obs.* i. p. 166, t. 19, f. 64.—*H. purpuragula* LEA, *loc. cit.* p. 163 t. 19, f. 60.—*H. avellana* FER. *Hist.* t. 103, f. 4, 5.—*H. hebe* DESH. in *Fer. Hist.* i, p. 211, t. 37 A, f. 5.—*H. bizonalis* GRAT. *Actes de la soc. Lin. de Bord.* xi, p. 412, f. 7. (*H. pudibunda* Beck and *H. solida* MKE. *teste* Pfeiffer).

Arango is undoubtedly right in declaring that the separation of this form into several species cannot be maintained. There is the greatest variation in form, size and color-pattern, but the extremes are united in every direction by intermediate specimens.

The coloration may be according to any of the patterns described below, or may be any combination of two or more of them.

(1.) Pure white with or without pale yellowish streaks; often quite globose, the aperture frequently deeply deflexed above.

(2.) White or yellowish, with two broad spiral zones of deep brown.

(3.) Whitish, with very numerous, irregular, dense, deep brown lines following the incremental striæ; heavy, globose, dark within the outer lip, peristome heavy, white. The outside coloration of this form (which is not figured on the plate) is very similar to that of *H. dennisoni* PFR. but the parietal wall is striped like the base of the shell. A modification of this type has the longitudinal streaking pale chestnut-yellow, interrupted by spiral white bands. It is quite globose. Another modification has the same longitudinal streaking, streaks more confluent, less distinct, often pale chestnut

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or pale purplish above, and encircled by several narrow, continuous or interrupted dark bands. It is generally thinner and more depressed than the preceding forms, and is perhaps the most abundant of all the color mutations. (figs. 21–25, 31). *H. hebe* (figs. 35–37) is the same.

(4.) Conical; dark chestnut or reddish brown all over, unicolored or with narrow, oblique white lines, which are close, crowded (fig. 32) or more separated (figs. 33, 34). This is *H. strobilus* FER. (figs. 26–28.)

H. DENNISONI Pfeiffer. Pl. 14, figs. 86–88.

errata

Very similar to color-mutation no. 3 of H. alauda, but distinguished by the deep ~~narrow~~ maroon color of the parietal wall and inside of the aperture. Coloration consisting of narrow, oblique deep-brown and yellowish lines on a white ground; with or without indications of two spiral interrupted bands.

Alt. 15 diam. 19; alt. 12 diam. 16 mill.

Cape St. Cruz, S. E. Cuba.

H. dennisoni PFR. *Zeitschr. f. Mal.* 1853, p. 56; *Moongr.* iii, p. 645; *Novit. Conch.* i, p. 53, t. 15, f. 7–10.—REEVE, f. 1020.—*H. juliana* POEY, *Memorias*, i, p. 208, t. 25, f. 13–16.

I have seen numerous specimens of this form, all from the locality given above. There are also before me specimens having the coloration of fig. 31, of pl. 16, but agreeing with *dennisoni* in the dark parietal wall. Two of these are figured on pl. 32, figs. 41–44. It may be noted that no true *alauda*, with light parietal wall are in the collection of the Academy from Cabo St. Cruz. My figures on pl. 14 are too red.

H. OVUMREGULI Lea. Pl. 14, figs. 89–91.

Imperforate, depressed, solid, opaque, polished all over, scarcely striate, white or tinted with bluish, creamy or pink, more or less thickly *covered with dark dots scattered irregularly*, and with or without numerous narrow brown spiral bands; spire depressed, a little convex, apex obtuse; whorls 4½, scarcely convex, the last wide, rounded at the periphery, depressed, *very suddenly and very deeply deflexed anteriorly*; aperture sub-horizontal, oblong, dark within; peristome expanded, labiate; white or (rarely) deep chestnut brown, its margins sub-parallel or converging, the upper arcuate, lower straight and thickened by a callus inside.

Alt. 10–12, diam. 17–20 mill. *Guantanamo etc., Eastern Cuba.*

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N. ovum-reguli LEA *Obs.* i, p. 164, t. 19, f. 61.—PHIL. *Abbild.* iii, Helix, t. 10, f. 6.—PFR. *Monogr.* i, p. 285; *Conchyl. Cab.* p. 356, t. 136, f. 9–11.—REEVE, f. 289.

H. LINDONI Pfeiffer. Pl. 14, figs. 99–101.

Imperforate, depressed-globose, thin, opaque, nearly smooth, slightly marked by growth-lines, white above, and marked with a narrow brown sutural line and scattered brown dots, beneath less dotted and more translucent; spire low, apex obtuse; whorls 4½, slightly convex, the inner ones corneous; last whorl wide, rounded at the periphery, deflexed anteriorly; aperture very oblique, rounded-lunar, white spotted with brown inside; *peristome thin, simple,* straight, or a trifle expanded on the base; columella entering, oblique, sub-arcuate, dilated, white.

Alt. 9½–10, diam 15–16 mill.

Bayamo and Mayari, Cuba.

H. lindoni PFR. *P. Z. S.* 1846, p. 110; *Conchyl. Cab.* t. 27, f. 9–11; *Monogr.* i, p. 29.—PHILIPPI, *Abbild.*, iii, Helix t. 10, f. 7.—ARANGO, *Fauna Mal. Cubana,* p. 64.—*H. lindeni* PFR. *Monogr.* iv, et v, REEVE, *Conch. Icon.* f. 291.—*H. immersa* GUNDL. in POEY, *Memorias* ii, p. 7.

A distinct species. Note the italicised passages in the description. I cannot adopt Pfeiffer's emendation of the name of this species. It is too late to change the spelling after a name has been used in such widely circulated works as the Proc. Zool. Soc., Conchylien Cabinet, Monographia Heliceorum, and Philippi's Abbildungen.

H. BARTLETTIANA Pfeiffer. Pl. 14, figs. 93, 94.

Imperforate, sub-turbinate, rather solid, smooth, shining, pale brownish, ornamented with streaks and bands of chestnut-color; spire conoidal, rather acute; whorls 5½, slightly convex, the last sub-planulate beneath; aperture sub-oblique, wide-lunar; peristome simple, acute, columellar margin planate, white, entering.

Alt. 13½, diam. maj. 18, min. 16 mill. (Pfeiffer.)

Bayamo and Santiago de Cuba, Cuba.

H. bartlettiana PFR. *Zeitschr. f. Mal.* 1848, p. 89; *Monogr.* iii, p. 11; *Conchyl. Cab.* p. 273, t. 113, f. 13–15.—*H. gossei var.* RVE, f. 262 [pl. 14, fig. 95].

I do not know the correct position of this form which has been

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placed by Pfeiffer in both Dialeuca and Polymita. I have not seen specimens.

H. MELANOCEPHALA Gundlach. Pl. 32, fig. 48.

Imperforate, globose-conical, somewhat depressed, rather thin but solid, opaque, rather shining, smooth, scarcely marked by growth-lines, pure white, covered with a very thin yellowish cuticle, encircled by the deep-brown, narrow, well-defined bands; spire more or less elevated, conoidal, apex obtuse, light or dark purple; whorls 4½, slightly convex, the last depressed-globose, abruptly and rather deeply deflexed anteriorly; aperture round-lunar, very oblique, trifasciate within; peristome narrowly labiate, white, upper margin arcuate, baso-columellar margin slightly concave, flattened, wide above, inserted in the center of the axis.

Alt. 11–12, diam. 14–16 mill.

Guantanamo and Mayari, Eastern Cuba.

H. melanocephala GUNDL. in PFR. *Mal. Blat.* 1859, p. 88; *Monographia* v, p. 50.—ARANGO, *Fauna Mal. Cubana*, p. 64.

A small, compact species, trifasciate with brown, and with abruptly deflexed last whorl.

Var. PERELEVATA Pilsbry. Pl. 32, fig. 49.

More elevated, globose, last whorl more descending anteriorly; trifasciate with brown, with an orange sub-sutural zone and one or two green spiral bands. Alt. 13, diam. 13–14 mill.

Cayo de Rey, Cuba.

H. VIGIENSIS Weinland. Pl. 14, fig. 85.

Imperforate, globose-depressed, obsoletely striate, solid, rather shining, whitish, frequently with scattered brown dots, encircled by three brown interrupted bands, the peripheral one strongest; spire obtuse, depressed, apex rosy-brown; whorls 5, somewhat convex, the last abruptly and deeply descending; base more or less excavated around the axis; aperture oblique, pinkish-brown within, lunate-oval; peristome acute, callous within, slightly expanded, margins sub-converging, columellar margin dilated, a little reflexed, impressed. Diam. maj. 14–17, min. 12–15. mill. (*Weinland.*)

Gonaives, Hayti.

H. vigiensis WEINL. *Jahrb. d. Mal. Gesell.* vi, 1880, p. 374, t. 12, f. 20.

Weinland says: There lie before me 18 examples of this species,

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one of them entirely white, without bands. The species belongs in the group *Coryda* Alb. of which heretofore no Haytien species has been made known to us. It gives the impression of a snail living in quite dry situations. The fine brown dots and the bands remind one of *H. ovumreguli* of Cuba., which is the same group, but is much larger, smoother, and is also separated by the more elongated, parallel margins of its nearly horizontal peristome.

H. NIGROPICTA Arango.

Imperforate, depressed, solid, obliquely, arcuately *costulate striate* smoky-brownish, ornamented with black interrupted bands; spire short convex-conoidal, apex glabrous; whorls 4½, moderately convex, regularly increasing, the last sub-depressed, shortly deflexed anteriorly; aperture very oblique, lunate-oval, shining within, violaceous; peristome labiate with lilac, margins scarcely converging, right lip briefly expanded, basal reflexed, at the insertion dilated, flat, adnate.

Alt. 10, diam. maj. 19 min. 15½ mill. (*Pfr.*)

Sagua de Tanamo, Cuba.

H. nigropicta ARANGO, in PFR. Malak. Blät. xiii, 1866, p. 57; *Monographia* v, p. 304.—ARANGO, *Fauna Mal. Cubana*, p. 73.

Known to me only by the above description.

H. GAUSSOINI Tryon. Pl. 14, fig. 92.

See appendix.

Globosely depressed, smooth, rather thick; spire depressed-conical, apex obtuse, suture moderately impressed; whorls 5½, convex, increasing slowly, not deflected at the aperture; aperture small, semi-lunar, labrum sharp, not reflected, but much thickened at the base, and terminating at the center of the base of the shell, where it is considerably impressed and dilated, covering the umbilicus; white, the spire a faint flesh color, (denuded of epidermis).

Alt. 6, diam. 9 mill. (*Tryon.*)

Island of Navassa.

H. gaussoini TRYON, *Am. Jour. Conch.* 1866, p. 304, t. 20, f. 1.—PFR. *Monogr.* vii, p. 270.

Tryon says: It is somewhat related to the Cuban group to which H. melanocephala etc., pertain. The minute island of Navassa is a mere speck upon the ocean, over a hundred miles south of the eastern extremity of Cuba, nearly as far east of Jamaica, lying between it and Hayti, about fifty miles west of the latter.

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Navassa is a guano island. The species does not seem to belong to *Coryda*, but without seeing a specimen I cannot guess at its affinities.

H. STENOSTOMA Pfeiffer. Pl. 14, fig. 84.

Imperforate, globulose-depressed, solid, nearly smooth, shining, white, ornamented with a single brown peripheral fascia and two series of orange maculations, obsoletely punctate with grayish; whorls 4½, scarcely convex, the last ventricose, abruptly deflexed anteriorly; aperture sub-horizontal, elliptical; peristome labiate, white, margins approximating, the upper narrowly expanded, basal arcuate, reflexo-appressed.

Alt. 9, diam. maj. 15½; min. 13 mill. (*Pfr.*)

Martinique.

H. stenostoma PFR. *P. Z. S.* 1846, p. 28; *Monogr.* i. p. 280. v, p. 304.

Known to me only by Pfeiffer's diagnosis and Reeve's figure.

Section VII. JEANNERETIA Pfeiffer, 1877.

Jeanneretia PFR. *Malak. Blät*, xxiv, p. 7.—PFEIFFER-CLESSIN, *Nomenclator Hel. Viv.* p. 116. 1881. (formerly included in *Fruticicola* and *Hygromia*.)

This is a distinct, well-marked section. It seems to me to be allied to *Eurycampta* Albers, not to Fruticicola etc., where it is grouped by Pfeiffer. Being imperfectly acquainted with the anatomy I am unable to decide whether these two sections (Jeanneretia and Eurycampta) should be grouped with Lysinoe and allied forms inhabiting the mainland of the Americas, or with the present group.

The radulæ and jaws are unknown. I expect to find that the central and lateral teeth have long basal-plates, bearing central cusps but not side cusps.

The genitalia (imperfectly known by Poey's incomplete figures, *Memorias*. ii, pl. 5, 6, 7,) are similar in Jeanneretia and Eurycampta; being characterized by the very slender penis, with the vas deferens inserted in its apex, and provided with an extremely long flagellum, and by the extremely long, slender duct to the spermatheca. All of these points agree pretty closely with Lysinoe and Odontura and also with Coryda, the only section of the Group *Hemitrochus* (in the wide sense) in which the genitalia are known. There is but little

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relationship between all of these sections and groups and the forms which group around Thelidomus, Caracolus, Dentellaria, etc.

H. MULTISTRIATA Deshayes. Pl. 10, figs. 88–92.

Perforate, globose-conoid-depressed, thin, subtranslucent, brownish-corneous with a brown supra-peripheral line; surface shining, slightly marked by irregular incremental lines, and by fine spiral ridges, narrower than the interspaces; spire conoidal, apex obtuse, whorls 5½, slightly convex, gradually increasing, the last somewhat dilated and gibbous behind the aperture, constricted behind the peristome on the base, descending to the aperture above; aperture quite oblique, rounded lunar; peristome narrowly reflexed, white, with an elongated dentiform callus within the baso-columellar margin; columella reflexed partly over the umbilicus.

Alt. 12, diam. 17–19 mill.; alt. 10, diam. 14 mill.

Cuba.

H. multistriata DESH., *Encyc. Méth.* ii, p. 248.—Lam., *An. s. Vert.*, ed. DESH., p. 102.—PFEIFFER, in *Küster's Conchyl. Cab.* t. 17, f. 13, 14; t. 17, f. 29, 30; *Monogr.* i, p. 134.—ARANGO, *Fauna Mal. Cub.* p. 78.—*H. circumtexta* FER., *Hist.* t. 27A, f. 4, 5, 6.—*H. vesica* LEA, *Obs.* i. p. 168, t. 19, f. 67. (*H. bicincta* Mke. Synops. ed. 2, p. 127, and *H. adjuncta* Zgl. teste Pfeiffer.)

H. pityonesica PFR. *Mal. Blät.* 1854, p. 156; *Monogr.* iv, p. 272. —REEVE, *Conch. Icon.* f. 1438.

This species is nearly allied to H. dermatina and H. wrighti. The following form seems to me to be only a variety.

Var. PITYONESICA Pfr. Pl. 10, fig. 94; pl. 32, fig. 60.

Umbilicus open or closed; form and sculpture as in the type; last whorl more deeply indented and constricted behind the periphery than in the type, peristome white or slightly pinkish.

Isle of Pines.

The shell figured by Reeve (fig. 94) is a small form, with subcarinate periphery.

H. WRIGHTI Gundlach. Pl. 10, figs. 97, 98.

Imperforate [or perforate] trochiform, carinate, rather thin, sculptured with numerous, close, elevated spiral ridges, about equal to the interstices; scarcely shining, brown, with a rufous peripheral line; spire conical, apex obtuse; whorls 5½, rather convex, the last slightly descending anteriorly, carinate at the periphery, the carina

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becoming almost evanescent on the latter part of the whorl; base moderately convex, somewhat tumid toward the aperture; aperture oblique, oblong-lunar; peristome fleshy-white, the margins scarcely converging, upper margin curved, slightly expanded, basal reflexed, appressed. Alt. 13, diam. 21 mill. (*Pfeiffer.*)

Western Cuba.

H. wrighti GUNDL. in PFR. *Mal. Bl.* 1865, p. 118; *Novit. Conch.* p. 270, t. 67, f. 6–8; *Monogr.* v, p. 272.

This form differs from the H. multistriata in being generally imperforate, carinated and more trochiform. I have seen but a single specimen. It is adult, but is narrowly perforated.

H. DERMATINA Shuttleworth. Pl. 10, fig. 93.

Imperforate, globose-conical, thin, obliquely delicately rugose, scarcely shining, pellucid, reddish yellow, ornamented with two narrow reddish bands; spire conical, acute; whorls 4½, scarcely convex, spirally sublirate above, the last briefly deflexed anteriorly and subconstricted; periphery carinated, base convex; columella flat, slightly arcuate, violet tinted; aperture oblique, rounded-lunar; peristome reddish-violet, all around narrowly expanded.

Alt. 11, diam. 16 mill. (*Pfeiffer.*)

Porto Rico, at Luquillo (Musas,) and Quebradillas.

H. dermatina SHUTT. *Diagn. n. Moll.* no. 6, p. 133.—REEVE, *Conch. Icon.* f. 1289.—PFEIFFER, *Monogr.* iv, p. 204.

Known to me only by the above description. Apparently a distinct species.

H. PARRAIANA d'Orbigny. Pl. 10, figs. 1–7.

Imperforate, globose-conical, or depressed, solid, reddish-brown, with a whitish peripheral zone bordered above by darker chestnut, lighter at the sutures and beneath; spire conic, apex subobtuse; surface spirally lirulate, and somewhat rugose longitudinally; whorls 6½, gradually widening, the last wider, rounded at the periphery, dilated and gibbous behind the aperture, then strongly constricted; deflexed anteriorly; aperture very oblique, rounded-lunar; peristome reflexed, white or flesh-colored, upper and outer margins arcuate, baso-columellar margin straightened, adnate over the umbilicus. There is often a small tubercle on the outer lip at the termination of the peripheral fascia. Alt. 22, diam. 26; alt. 16, diam. 22 mill.

Cuba.

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H. parraiana ORB. *Moll. Cuba*, i, p. 146, t. 7, f. 7–9.—PFR. *Monogr.* i, p. 227; *Conchyl. Cab.* t, 146, f. 8–10; t. 151, f. 11, 12.—REEVE, f. 263.—ARANGO, *Fauna Mal. Cubana* p. 69.—*H. parallela* POEY, *Memorias*, ii, p. 88.—PFR. *Novit. Conch.* t. 61, f. 4–6; Monogr. v, p. 354.

An abundant and variable shell. Sometimes it is elevated, conical, sometimes depressed, often carinated at the periphery. There is also much variation in the coarseness of the sculpture, the size and color. Umbilicated specimens are not infrequent. Figs. 1 to 5 represent typical examples.

A small form is rather lighter in color than the types. It measures alt. 10, diam. 15 mill. Others measure, alt. 14, diam. 18 mill.

Var. PARALLELA Poey. Pl. 10, figs. 95, 96, 6, 7.

Light yellowish, with two dark chestnut bands, the lower one often lost, generally rather more depressed than the type, and umbilicus often open. Dimensions the same as in the type.

H. SAGRAIANA d'Orbigny. Pl. 7, figs. 69–71.

Umbilicate, depressed conical, solid, whitish, strongly, acutely, lirulate all over; spire conical; whorls 6½, very gradually increasing, the last subangular at the periphery, not gibbous behind the aperture, a little descending anteriorly; aperture quite oblique, rounded-lunar; peristome narrowly reflexed, margins converging, the columella bearing a strong callous tooth within. Umbilicus deep, partly covered by the reflexed columellar lip.

Alt. 19–20, diam. 30–32 mill.

Western Cuba.

H. sagraiana ORB. *Moll. Cuba* i, p. 145, t. 7, f. 4–6.—PFR. in *Conchyl. Cab.* t. 55, f. 1, 2; *Monograhia* i, p. 324.—REEVE, *Conch. Icon.* f. 265.—ARANGO, *Fauna Mal. Cubana* p. 75.

Easily recognized by the columellar tooth, the lack of dilation and constriction of the last whorl behind the aperture, etc. Not a common species.

H. SUBTUSSULCATA Wright. Pl. 10, figs. 99, 100, 101.

Imperforate, globose-conoid, solid, obliquely striatulate and spirally delicately, regularly striate; yellowish with two or three spiral bands of brown; spire conoidal, obtuse; whorls 6, the last compressed on the base opposite the aperture, and with a deep curved scar or trench, producing an elongated fold or tooth inside the whorl;

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deflexed toward the aperture; aperture rounded-lunar, very oblique; peristome reflexed, thickened, white or flesh-colored, its margins slightly converging.

Alt. 26, diam. 30 mill.; alt. 31, diam. 31 mill.; alt. 17, diam. 24 mill.

Western Cuba.

H. subtussulcata WRIGHT, (teste Gundlach *in litt.*) PFEIFFER, *Malak. Bl.* 1863, p. 199; *l. c.* 1864, p. 124; *Novit. Conch.* t. 61, f. 1–3; *Monographia* v, p. 279.—ARANGO, *Fauna Mal. Cubana*, p. 69.

Quite variable in size and elevation, but instantly known by the deep curved pit upon the base opposite the aperture, which produces a tooth inside, much as in the subgenus Cepolis. H. subtussulcata is nevertheless a genuine Jeanneretia.

Group XII. POLYMITA Beck.

On account of the peculiar dentition of the snails of the section Polymita, I think it is entitled to rank equal with the other divisions called Groups in this work. The shells are quite similar to those of Hemitrochus in general aspect; but they have simple, not expanded peristome, and fewer, more rapidly enlarging whorls. The coloration is scarcely equalled for brilliancy and beauty among all the land shells. All of the species are Cuban.

I am inclined to attribute the gouge-shaped teeth of the radula to the modification effected by fruit-eating habits, for the broad cusps of these Helices would doubtless be more effective than the common narrower, acute type of teeth. The coloration also may be accounted for by assuming it to be a protective adaptation; for both the yellow and red forms of H. picta are much the color of ripe bananas and other fruits. This way of accounting for the principal characterstics of this group—brilliant hues and abnormal, gouge-shaped teeth—although it strikes me as a probable explanation, rests upon very slender foundation of fact; for all I know of the life-history or habits of the snails in question is derived from Mr. Binney's remark that he had received a specimen found on a bunch of bananas in New York.

Section POLYMITA Beck, 1837.

Shell semiglobose or subglobular, rather thin but solid, imperforate, brilliantly painted; whorls 4 or less, the last slightly deflexed at the aperture; aperture large, rounded, slightly lunate; peristome

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simple, not expanded nor reflexed, except at the axis, where it is reflexed and closely adnate over the umbilical tract. Type, H. picta Born.

Polymita BECK, *Index Moll.* p. 44.

H. PICTA Born. Pl. 15, figs. 5–15; pl. 13, figs. 75, 77.

Imperforate, globose, inflated, thin but strong, opaque, almost smooth, with delicate incremental marks. Color very variable and bright; usually white, gamboge or lemon-yellow, vermillion, flesh colored, pink, olive or green, with a spiral dark, white or colored subsutural border, a supra-peripheral band of white, dark or of both, the axis surrounded by a tract of the same colors; positions of former peristomes marked by one or several oblique dark streaks. Spire low, obtuse; whorls 3½, very rapidly enlarging, the last descending anteriorly; aperture very large, oblique, rounded, white or colored inside; peristome simple but obtuse.

Alt. 30, diam. 33 mill. Dimensions of an average specimen, alt. 23, diam. 26 mill.

South-eastern Cuba.

H. picta BORN, *Mus. Test. Cæs.* p. 386, t. 15, f. 17, 18—FER. *Hist.* t. 9B, f. 6, 7; t. 11A, f. 14; t. 12–14, f. 1–5; t. 25A, f. 1–6 etc.—ORB. *Moll. Cuba*, p. 160, t. 5, f. 1–3.—PFEIFFER, *Conchyl. Cab.* t. 27, f. 1–8; *Monogr.* i, p. 26; v, p. 49; *Novit. Conch* p. 296, t. 72, f. 4, 5, 19, 20.—REEVE, f. 256.—ARANGO, *Fauna*, p. 61.—BINNEY, *Ann. Lyc. N. H. N. Y.* x, t. 16, f. 14; *Proc. Phil. Acad.* 1874, p. 56; *Ann. N. Y. Acad. Sci.* iii, p. 90, t. 3, f. E.—*H. venusta* Gmel., *Syst. Nat.* xiii, p. 3650.—*H. sulphurosa* MORELET, Test. noviss. no. i, p. 8.—PFEIFFER in *Conchyl. Cab.* t. 158, f. 1, 2; *Novit. Conch.* p. 239, t. 61, f. 13, 14; *Monographia* iii, p. 29; v, p. 49.—REEVE, f. 590.—*H. picta var.* CHENU, *Ill. Conch.* Helix, t. 3, f. 1.

Most of the color-patterns of this beautiful shell are figured on plate 15. There is one other notable style of painting, shown in fig. 58, pl. 32, consisting of numerous dark chestnut bands and lines on a light ground. The inner whorls are frequently lighter and speckled with dark dots, like H. muscarum. There are usually present one or several conspicuous dark oblique streaks upon the last whorl, but these are sometimes wanting.

According to Arango, the form prevalent in Baracoa is large, shining, whitish or rosy with dark streaks; near Cape Maisi the shells are dull, with a velvety aspect; in the district of Jauco the

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prevailing form is longitudinally banded; and in the district of Maisi the specimens are small, globose, solid, and highly colored.

The form known as H. SULPHUROSA Morelet, (pl. 13, figs. 78–80) does not seem to have any distinctive specific characters. It is small, globular, shining, yellow, unicolored or marked with white, suture bordered by a narrow dark line. Alt. 16, diam. 18–20 mill.

Baracas and Jibara, Cuba.

H. VERSICOLOR Born. Pl. 13, figs. 72–74.

Imperforate, subglobose, thin, solid, opaque, white, encircled by well-defined black, brown, yellow, red, and green bands, or by brown or blackish alone or in combination with one or two of the other colors; no longitudinal dark streaks nor dots scattered over the upper surface; spire subconoidal; whorls 4, the last slightly descending anteriorly; aperture rather small, oblique, rounded-lunar; peristome thin, acute; columella and parietal wall pink.

Alt. 22, diam. 25 mill.

South-eastern Cuba.

H. versicolor BORN, *Test. Mus. Cæs.* p. 386, t. 16, f. 9, 10.—FER., *Hist.* t. 17, f. 1–3.—PFR. in *Conchyl. Cab.* t. 28, f. 10, 11; *Monographia* i, p. 26; v, p. 49, 465.—ARANGO, *Fauna*, p. 61.—*H. globulosa* PFR. *Symb.* ii, p. 29.—(*H. pictoria* et *cincta*, PERRY, *Conchology*, t. 15, figs. 1, 3. ?)—*Polymita versicolor* BECK, *Index*, p. 45.—W. G. BINNEY, *Ann. N. Y. Acad. Sci.* iii, p. 90.

Separated from H. picta by the numerous, variously colored, well-defined bands, the lack of oblique streaks, smaller aperture, sharper lip, etc. From *H. muscarum* by the different color-pattern, lacking dots scattered on the upper surface, and the less contracted aperture.

H. MUSCARUM Lea. Pl. 15, figs. 16–19.

Imperforate, globose, solid, opaque, variously colored. The principal patterns are (1) white, unicolored with scattered dots of translucent gray; (2) ochraceous, with a dark subsutural line, with or without two supra-peripheral white or blackish bands, dotted with dark all over; (3) white, with peripheral ochraceous or black, or ochraceous and black bands, dotted as usual, or (4) very sparsely dotted; bands of black or chestnut, white and ochraceous. Spire more or less elevated, but with a peculiarly depressed aspect to the upper whorls. Whorls 4, apex scarcely flattened, last whorl descending

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anteriorly; aperture smaller than in H. versicolor; peristome simple, slightly labiate within; columella and parietal wall pink except in the pure white variety.

Alt. 17, diam. 17 mill.; alt. 21, diam. 21 mill.

Nuevitas y Sagua to Tanamo, South-eastern Cuba.

H. muscarum LEA, *Obs.* i, p. 163, t. 19, f. 59.—PFR. in PHILIPPI, *Abbild.*, ii, t. 4, f. 10; *Conchyl. Cab.* p. 223, t. 27, f. 12–21; *Monogr.* i, p. 27; v, p. 49.—REEVE, f. 290.—ARANGO, *Fauna*, p. 62.—*H. globulosa* FER. *Hist.* t. 25, f. 3, 4; t. 25A, f. 7, 8. (preoc.)—WOOD, *Index Test.* suppl. t. 7, f. 35.—*H. carnicolor* ORB. *Moll. Cuba* i, p. 158, t. 10, f. 5–8.—*Polymita muscarum* W. G. BINNEY, *Ann. N. Y. Acad. Sci.* iii, p. 90 (dentition.)

H. muscarum differs from H. versicolor in the different coloration, smaller aperture, differently shaped spire, and in the dark dots scattered irregularly over its surface.

Var. SUBBROCHERI Pilsbry. Pl. 32, fig. 60.

I propose this name for a form of Polymita intermediate between H. muscarum and H. broche in form. It is solid, opaque, white, with three ochraceous zones and pinkish aperture.

Alt. 22, diam. 19 mill.

H. BROCHERI Gutierrez. Pl. 19, figs. 57, 58.

Imperforate, oblong-conical, solid, with an opaque white ground-color, marked (1) by numerous narrow longitudinal light chestnut streaks, interrupted by a white zone near the suture, two narrow blackish median bands, and usually two more dark lines on the base, near together; or (2) no longitudinal streaks; blackish basal and subsutural bands; a pair of wide chestnut zones around the median part of the whorl; or by some combination of these markings, rarely nearly unicolored, white. Surface slightly marked by growth-lines, shining. Spire very much elevated; apex obtuse; whorls 5, convex; aperture small, irregularly oval; outer and basal lips simple, acute, white or maroon inside; columella subvertical, more or less prominently folded in the middle, and together with the parietal wall, crimson or maroon colored.

Alt. 23, diam. 17 mill.; alt. 26, diam. 15 mill.

Eastern extremity of Cuba.

H. brocheri Gut. *mss. teste* Gundlach, *in litt.* PFEIFFER, *Novitates Conch.* ii, p. 237, t. 61, f. 7, 8.—*Malak. Bl.* 1864, p. 124; *Mono-*

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graphia, v, p. 50.—*H. brocheroi* Gutz., ARANGO, *Fauna Mal. Cubana*, p. 64.

Like no other species in the elevated Bulimus-like form.

Group XIII. THELIDOMUS Swainson.

A group of large, semiglobose snails, confined to the West Indies in distribution. And allied in the characters of both shell and animal to the succeeding groups (Caracolus, etc.) not to the preceding (Hemitrochus, etc.), which belong with the great group comprising most of the banded snails of Europe and the Americas, such as Pomatia, Arionta, Lysinoe, Odontura, Tachea, etc.

The shell in the present group is generally rather large, not much variagated, nor bright in color, usually granulated, decussated, or at least, strongly costulate. The aperture is generally large, not obstructed by teeth, though often narrowed by a basal callus. The axis is usually imperforate; the periphery is rounded, except in a few species.

This group is composed of part of the elements of Férussac's *Helicogena*. It is equal to the subgenus *Helicogena* of Fischer only in part; for I have been obliged to dismember that group as constittued by him (Manuel de Conchyl., p. 471), placing Coryda, Histrio and Dialeuca in my group Hemitrochus, and Oxychona in the immediate neighborhood of Caracolus.

Synopsis of Sections.

Section THELIDOMUS Swainson, 1840.

Shell globose-depressed, with 4½ or less whorls, the last deflected at the aperture, rather gibbous beneath, carinated or rounded at the periphery; surface costulate, granulated or decussated; aperture very oblique; peristome more or less expanded, thickened within, lower margin straightened, with a plate-like callus inside, its edge sometimes toothed. Type, H. incerta, Fér.

Section PARTHENA Albers, 1850.

Shell globose or depressed, whorls rapidly widening, the last large, carinated or rounded at the periphery; surface visibly or microscopically granulated; aperture large; peristome expanded, columellar margin more or less arcuate, never dentate, nor with a plate-like callus within. Type, H. angulata Fér.

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Section THELIDOMUS Swainson.

Thelidomus SWAINS., *Shells and Shell-fish*, p. 330, 1840. (not *Thelidomus* SWAINS., *l. c.*, p. 353,=*Helicopsyche* Brem., 1848; larva-cases of a neuropterous Arthropod).—*Otala* BECK, *Index*, p. 35. (1837).—MORCH, *Cat. Yoldi.*, p. 12,—H. and A. AD., *Gen. Rec. Moll.* ii, p. 197. (not of SCHUM.)—*Pachystoma* ALBERS, *Die Heliceen*, 1850, p. 125. (not *Pachystoma* GUILDING, *Zool. Journ.*, p. 536, 1828, =typical Ampullaria.)

Thelidomus exhibits a certain likeness to the Canary Island group Hemicycla. The species fall into two sections; (1) variegated, granulate species, inhabiting Jamaica, Porto Rico and the lesser Antilles, and (2) straw-colored or light russet forms confined (with one exception) to Cuba. The latter section is capable of being subdivided into two natural groups, founded upon the presence or absense of microscopic spiral incised lines upon the shell. The species of the second division, without spiral lines, belong for the greater part to the eastern extremity of the Island. They form a very homogeneous assemblage; and hair-splitting has been resorted to by authors to keep up the specific lines. I have given distinctive characters which will enable the student to identify most specimens; but in the group of auricoma, bayamensis, provisoria, there occur forms nearly or entirely intermediate.

* * *

Shell generally variegated; rugose or granulate. Species of Jamaica, Porto Rico and the lesser Antilles.

H. INCERTA Ferussac. Pl. 4, figs. 36, 37; pl. 1, figs. 1, 2.

Imperforate, globose-depressed or subconoidal, opaque, lusterless, light yellow, with numerous narrow longitudinal streaks and few or many interrupted spiral bands of dark chestnut color or umber; irregularly, inconspicuously obliquely striate, the whole surface covered with a more or less obvious rather coarse, often subobsolete granulation; spire elevated or depressed, the apex and inner whorls light corneous, nearly smooth, but slightly convex, the outer one or two whorls more convex, separated by deeper sutures; whorls 4, the last *rounded, never carinated*, a little deflected toward the aperture, convex below; aperture oblique, wide-semilunar, white within; outer lip narrowly and slightly expanded, baso-columellar margin very oblique, expanded, wide, adnate to the base, thickened within

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with a plate-like white callus which is more or less notched at its junction with the base, and is generally obtusely subdentate near its insertion, sometimes bearing on its face a short carina of callus; parietal callus very light. Alt. 20, diam. 24 mill.

Porto Rico, St. Thomas, Tortola, St. Bartholemew, Anegada.

H. incerta FER., *Hist.*, t. 105, f. 2.—PFR., *Symb.*, p. 37. (1841)—*H. lima var. notabilis* Fér., Hist., t. 46A, f. 4, 5.—*H. notabilis* SHUTT., *Diag. neuer Moll.*, (6) p. 132. (1854).—*H. curvidens* PFR., *P. Z. S.* 1854, p. 147.—REEVE, *Conch Icon.*, f. 1360.—*H. striolata* GUILDING, and *alutacea* ZGL. *Mss.*—*H. velutinoides* Anton, Verzeich., p, 36. (juv.)—*Otala ravnii* BECK, *Index*, p. 36, *teste* Albers.

This form was twice figured by Férussac, and two names imposed. The first *description* is that of Pfeiffer, in 1841, and applies to the species as found subfossil, lacking cuticle and color. From H. lima this species differs in being more elevated, never carinated when adult, differently colored, etc. The spire is often abnormally elevated. The fossil form (from *St. Thomas*) is often larger (28 mill. diam.) and sometimes subcarinated. Most or all of the Virgin Islands, lying eastward from Porto Rico, are inhabited by this species.

H. LIMA Férussac. Pl. 1, figs 5, 6.

Imperforate, depressed-conoidal, lusterless, yellowish, with ill-defined oblique, narrow, chestnut, or umber streaks, the entire surface except the upper whorls coarsely granulate, the granules lighter than the ground-color; spire conoidal, whorls slightly convex, apex and inner whorls nearly smooth; whorls 4½, the last angular sometimes becoming rounded toward the aperture, transversely inflated, decidedly deflected toward the aperture; aperture wide; outer lip expanded, baso-columellar lip subhorizontal, adnate, with a wide callus plate within, which is truncate more or less at its base, and bears about midway a strong tooth-like fold.

Alt. 19, diam. maj. 30, min. 24 mill.

Porto Rico; Viéque; Curacao.

H. lima FER., *Hist.*, t. 46, f. 1, 2.—PFEIFFER, *Conchyl. Cab.*, p. 55, t. 7, f. 13, 14.—REEVE, *Conch. Icon.*, f. 214.—*H. punctifera Lam.* DESH. *Encyc. Meth.*, ii, p. 249.—*Otala asperula* BECK, *Index*, p. 36. —*H. castrensis* PFR., *P. Z. S.* 1856, p. 386, and *Novit. Conch.* i, p. 109, t. 31, f. 3, 4.

The present form is typically more carinated, more depressed,

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more densely and conspicuously granulated and less variegated than H. incerta. More important differences are in the more dilated form (note the ratio of the two diameters), and in the greater development of the peristome. The columella is nearly horizontal, and bears a strong callus fold about the middle.

Two variations deserve notice; one, var. CASTRENSIS Pfr., represented on pl. 1, fig. 3, is nearly devoid of granules, more carinate than the type, and conspicuously obliquely streaked; the other, pl. 1, fig. 4, is very small and less granulate than the type.

H. ASPERA Férussac. Pl. 4, figs. 32–35.

Imperforate, large, solid, globose-depressed, lusterless, white, or more or less clouded with brown, especially toward the aperture, the upper whorls generally with a few zigzag brown markings; entire surface of the last two whorls densely coarsely granular; apex planulate, inner whorl white, smooth; suture linear; whorls 3, very rapidly widening, the last transversely dilated; body-whorl large, rounded, deeply, abruptly deflexed anteriorly; aperture oblong, peristome revolute, heavy, baso-columellar adnate to the base, broad, oblique, flattened, the inner edge nearly straight and almost always bearing a series of strong comb-like teeth; parietal callus brown..

Alt. 35, diam. maj. 55, min. 40 mill.

Jamaica.

H. aspera FER., *Hist.*, t. 44, f. 1–3—PFR. *Conchyl. Cab.*, t. 62, f. 1, 2—RVE., f. 207.—*H. granosa* WOOD, *Ind. Test.*, suppl., t. 7, f. 45.

A well-known form, distinct from the following in the granulation of the surface and the teeth of the columella.

H. COGNATA Férussac. Pl. 4, figs. 38, 39.

Imperforate, large, solid, globose-depressed, very similar in form, size, and shape of whorls to H. aspera. The surface is clouded with dark brown, is nearly smooth and somewhat shining; whorls 3½, very rapidly widening, the last deflected anteriorly; aperture oblong, livid within, the lip white, revolute; columellar margin concave, its inner edge simple or obsoletely toothed.

Alt. 33 diam. maj. 53, min. 38 mill.

Jamaica.

H. cognata FER., *Hist.*, t. 44, f. 4.—PFR. *Symb.*, iii, p. 72.—PFR., *Conchyl. Cab.*, t. 43, f. 5, 6.—*Rve. Conch Icon.*, f. 180.

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Distinguished from H. aspera by the smooth surface, dark clouded coloration, and (generally) edentulous columella.

H. DISCOLOR Férussac. Pl. 5, figs. 45–47.

Imperforate, depressed, opaque, somewhat shining, rather thin, with a thin rich yellowish-brown cuticle, generally encircled just above the periphery with a white band, just below with a dark one; the whole surface under a lens seen to be marked with slight incremental marks, very numerous spiral impressed lines, and obliquely descending microscopic corrugations. There are also on most specimens rather coarse, but superficial radiating undulations visible above; apex nearly planulate; suture linear, becoming impressed; whorls 3½ to 4, the inner two nearly smooth, scarcely convex, the outer whorl transversely dilated, rapidly widening, subcarinate or rounded at the periphery, tumid beneath, slightly deflexed and quite inflated above toward the aperture; aperture oblong, wide; peristome revolute, thick, brown; baso-columellar margin adnate to the base, thickened by a plate-like callus within, its edge more or less irregular and sinuous. Alt. 23, diam. maj. 38, min. 30 mill.

Martinique; Cayenne; Trinidad (?)

H. discolor Fér., *Hist.*, t. 46, f. 3–6.—PFR., in *Conchyl. Cab.*, t. 9, f. 11, 12.—REEVE, *Conch. Icon.*, f. 253.

Quite a distinct form. The microscopic sculpture, brown peristome and sinuous, subhorizontal columella are diagnostic characters.

* * *

Shell unicolored, straw-color or golden-brown with a few narrow darker longitudinal streaks; surface striate or decussated; aperture white within. Species of Cuba and the Bahamas.

A. Surface decussated by microscopic impressed spiral lines, which cut the incremental striæ.

H. PETITIANA d'Orbigny. Pl. 5, figs. 42–44.

Imperforate, large, depressed, subtranslucent, slightly shining, pale straw-colored, apparently smooth, but under a lens seen to be cut into excessively fine granules by the decussation of incremental striæ by spiral impressed lines; spire very small, short, conoidal, obtuse; sutures impressed; whorls 4, convex, rapidly increasing, the last about as wide as all the inner ones together, with convex, full, outlines, deeply deflected toward the aperture; aperture oblong, very oblique; peristome broadly reflected, adnate to the base; columellar margin flattened, with a truncated plate-like callus within.

Alt. 33, diam. maj. 68, min. 50 mill.

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Province of Trinidad, Cuba, at head-waters of the rivers Caballero and San Juan.

H. petitiana d'ORB., *Moll. Cuba*, p. 144, t. 9, f. 1—3. (1853)–PFR., *Monogr.*, i, p. 263, and in *Conchyl. Cab.*, t. 157, f. 1, 2.

Allied to H. guanensis, but (typically) larger, and more depressed. It is always smoother than that species, aperture is much more oblique, the lip more broadly reflected, and the callus plate of the columella more truncate; although in this character H. petitiana is somewhat variable.

H. GUANENSIS Poey. Pl. 3, figs. 21–23.

Imperforate, large, depressed-globose, rather opaque, scarcely shining, cuticle stronger than in H. petitiana, golden-brown, but sometimes light enough to be called straw-colored; upper surface more or less strongly, regularly, obliquely striate, sometimes costulate, sometimes nearly smooth, smoother beneath; under a lens seen to be densely marked with microscopic spiral impressed lines; spire short, apex planulate, inner whorl glossy, white; sutures impressed; whorls 4, convex, rapidly widening, the last wide, convex, anteriorly rather deeply deflexed; aperture quite oblique, truncate-oval; peristome reflexed, thickened, upper and outer margins arcuate, baso-columella margin straighter, flattened, adnate to the base.

Alt. 35, diam. maj. 55, min. 40 mill.; alt. 35, diam. maj. 43, min. 36 mill.

Guane, Cuba.

H. guanensis POEY, *Memorias Hist. Nat. Cuba*, ii, p.35, pl. 4, f. 11–14. (1856–'58.)—PFR., *Novit. Conch.*, p. 180, t. 49, f. 1–3.—ARANGO, *Faun. Mal. Cub.*, p. 70.

This species is separated from H. auricoma and its allies by the possession of microscopic spiral impressed lines lacking in those species. It differs from H. petitiana in being more coarsely striate, darker colored, and especially in the wider, less oblique aperture, its peristome less broadly reflected. There is great variation in the sculpture of oblique striæ, but look for the diagnostic spiral lines.

H. SCABROSA Poey. Pl. 4, figs. 40, 41.

Imperforate, depressed-globose, solid, opaque, nearly lusterless, light golden-brown, the upper surface rather coarsely costulate-striate, the costulæ irregular, anastomosing and bifurcating, themselves covered by a microscopic sculpture of oblique wrinkles and

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spiral impressed lines, the base smoother; spire short, apex planulate, glossy, the suture impressed; whorls 4, convex, rapidly increasing, the last large, wide, transversely dilated, rather suddenly and deeply deflexed anteriorly; aperture very oblique, irregularly quadrangular; peristome reflexed in every part, rather narrowly above, the upper margin arcuate, baso-columellar margin substraightened, flattened, with an obtuse, subdentiform prominence on its inner edge, near the insertion.

Alt. 27, diam. maj. 42, min. 33 mill.

Province of Trindad, Cuba.

H. scabrosa POEY, *Memorias, etc.*, i, p. 421, t. 34, f. 1–5, *l.c.* ii, p. 57, 67, t. 6, f. 13.—PFR., *Novit. Conch.*, p. 181, t. 49, f. 10, 11, and *Monogr.*, v, p. 287.

The coarse, irregular, anastomosing incremental wrinkles of the upper surface separate this species from any of the preceding, and the microscopic impressed spiral lines from forms otherwise somewhat similar. The sculpture is not very well shown in the figure.

B. Surface not cut by spiral incised lines.

H. AURICOMA Férussac. Pl. 3, figs. 26–30.

Imperforate, globose, rather solid, rather opaque, straw-color or yellowish russet, strongly obliquely striate above, the striæ or costulæ somewhat unequal and irregular, but very rarely anastomosing, the interstices between them smooth or rarely a little wrinkled transversely, base much smoother; spire low-conical, apex obtuse, smooth, white, sutures impressed; whorls 4, convex, the last wide, rounded, subgibbous toward the aperture, where it is deeply deflected; aperture very oblique, irregularly subquadrate; peristome expanded, heavy, thick; columella oblique, straightened, forming an angle at its junction with the outer lip, and flattened, its inner edge more or less obviously two-lobed. Alt. 30, diam. maj. 40, min. 34 mill.

Entire Island of Cuba.

H. auricoma FER., *Hist.*, t. 46, f. 7–9.—ORB., *Moll. Cuba*, i, p. 143, t. 5, f. 4–7.—PFR., in *Conchyl. Cab.*, p. 54, t. 7, f. 3, 4.—REEVE, *Conch. Icon.* f. 239.—*H. microstoma* LAM., *An. s. Vert.*, vi. p. 72.—*H. bonplandii* VALEN., in *Homb., Zool.*, ii, p. 239, t. 56, f. 3.—(not of Lam.)

A species quite variable in size, but moderately constant in sculpture and in the form, which is orbicular, *not much dilated transversely.* The difference between the major and minor diameters is

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not nearly so great as in H. bayamensis, trinitaria, rangelina, barracoensis, proboscidea, guatanemensis, or even provisoria. The body-whorl is more globose than that of rangelina, and the columellar plate is not, usually decidedly truncate as in that species.

Var NOSCIBILIS Fér. Pl. 3, fig. 31; pl. 1, figs. 7, 8, 9.

Shell similar to the type in form; straw-colored; whorls 4, callus plate of the columella slightly subtruncate at base or nearly straight.

Alt. 16, diam. maj. 20, min. 18 mill.

This form leads toward H. emarginata.

Var. ZETA Pfr. Pl. 3, figs. 24, 25.

Solid, globose-conoid, basal margin of the peristome strongly dentate. This may be a form of H. rangelina, which it resembles exactly in the columella. Although many specimens are before me I am unable to satisfy myself regarding it.

Var. PROVISORIA Pfeiffer. Pl. 17, figs. 41, 48, 49.

Imperforate, globose-subdepressed, moderately solid or thin, yellowish russet colored costulate-striate above, the costulæ strong, pretty regular, smooth, bifurcating but rarely, base smooth, glossy; spire short, low-conoidal, apex obtuse, first 1½ whorls smooth, whitish, glossy; sutures moderately impressed; whorls 3½ to 4, moderately convex, rapidly increasing, the last slightly dilated transversely, rounded, tumid below, deflected anteriorly; aperture oblong-truncate, oblique; peristome slightly expanded or not perceptibly so, somewhat thickened, but less so than in the allied species, upper and outer margins arcuate, baso-columellar margin flattened, its inner edge thin, straight or concave, not truncate below, somewhat angled where it joins the outer lip or rounded there.

Alt. 20, diam. maj., 27, min. 22½ mill.

Baracoa etc., Eastern Cuba; New Providence, Bahamas.

H. provisoria PFR., *Malak. Bl.* 1858, p. 39. and *Monogr.*, v, p. 288. —ARANGO, *Fauna Mal. Cubana*, p. 72.—(*H. appendiculata* GUNDL., in sched., 1859.)

Like H. bayamensis, this shell is coarsely costulate above, glabrous beneath. From that species it may be distinguished by the generally smaller size, more inflated, less depressed body-whorl and the (usually) less developed peristome. It is also less dilated transversely than bayamensis. From H. auricoma it may be separated by its slightly more transversely-dilated form. But there seems to be no

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good reason for separating provisoria from Férussac's species. I consider it a mere variety, at most.

H. EMARGINATA Gundlach. Pl. 1, fig. 14; pl. 3, figs 17, 19.

Imperforate, small, solid, globose-conoid, shining, light olive-brown or yellowish-brown, strongly obliquely plicatulate-striate, interstices between the striæ smooth or a little wrinkled transversely, base smoother; spire conoid, short, the apex obtuse, smooth, white, sutures impressed; whorls 4, moderately convex, the last globose, tumid beneath, abruptly, deeply deflected toward the aperture; aperture contracted, very oblique, small, subtriangular-lunar; peristome contracted, thickened, narrow, baso-columellar margin straightened, bearing in the middle a strong tubercular tooth.

Alt. 15–18, diam. 20 mill.

Guantanamo, Eastern Cuba.

H. emarginata GUNDL. *Mss;* PFR., *Malak. Bl.* 1859, p. 86.–*Novit. Conch.*, p. 182, t. 49, f. 4, 5.—ARANGO, *Fauna Mal. Cubana*, p. 72.

This small, globose shell may be known from all others by the contracted aperture, and the *tooth in the middle of the basal margin* of the aperture. The form is but slightly dilated transversely.

H. BAYAMENSIS Pfeiffer. Pl. 2, figs. 1–3.

Imperforate, depressed-globose, moderately solid, slightly lustrous above, shining beneath, clear straw-colored, above more or less deeply tinged with russet but without darker oblique streaks, or with a few very ill-defined ones; upper surface costulate-striate, the costulæ moderately regular, smooth, and (comparatively) rarely bifurcating; upon the periphery they become obsolete, leaving the base smooth and glossy; spire short, low-conical, apex flattened, first 1½ whorls glossy; whorls 4, a little convex, rapidly widening, the last transversely dilated, rounded, rather abruptly deflected to the aperture; aperture extremely oblique, subtriangular-lunar; peristome a trifle expanded, thickened within, heavy, its upper margin decidedly arched, almost subangular sometimes, the baso-columellar margin forming an angle where it joins the outer lip, straight, its inner edge bearing a slightly developed projection of callus near the insertion, never toothed or truncate at the base.

Alt. 23, diam. maj. 34, min. 26 mill.

Bayamo, Guantanamo, Santiago de Cuba, etc., in Eastern Cuba.

H. bayamensis PFR., *Malak Bl.*, 1854, p. 189, t. 2, f. 4–6.—*H. noscibilis?* PFR., in *Conchyl. Cab.*, p. 252, t. 114, f. 10, 11.

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The affinities of this form are with H. auricoma on one hand and on the other with (1) the series of trinitaria, barracoensis and lamellicosta; and (2) that of guantanamensis, proboscidea, rangelina.

The body-whorl is more depressed than in H. auricoma, less full or gibbous below; the color is lighter than most specimens of auricoma, but this is a trifling character; the body-whorl is decidedly more dilated transversely than in auricoma, and the aperture is more oblique. Measuring *inside the peristome*, the mouth of auricoma is generally higher than wide; whilst that of bayamensis usually is wider than high. H. guantanamensis is still more depressed and dilated transversely than this species, is rather more finely striate above, and less glabrous beneath, for the striæ do not become obsolete at the periphery, but extend upon the base. The columella is not truncate in H. bayamensis, as it is in H. rangelina, H. guantanamensis, etc.; and there is no streak of orange-russet behind the ~~periphery~~ peristome as there is in the last-named species. errata

The variation in size is so great that one is almost inclined to say that the species is composed of elements more dissimilar to each other than to allied forms.

VARIETY. (Pl. 17, fig. 44.) The figure represents a large, rather thin-shelled form, regularly and rather finely costulate above; the aperture is subangular at base, as it almost always is in this species, although not represented sufficiently so in fig. 1 of pl. 2. The largest specimen I have seen measures; alt. 25, diam. maj. 43, min. 33 mill.

VARIETY. (Pl. 1, figs. 15–17.) The form here figured is much smaller than the type, with more oblique, smaller aperture; above it is strongly costulate-striate, beneath shining, nearly smooth; whorls about 3½; aperture truncate oval; peristome quite thick. Alt. 14, diam. maj. 25, min. 19 mill. A specimen before me measures but 21 mill. diam.

H. GUANTANAMENSIS Poey. Pl. 2, figs. 7–9.

Imperforate, depressed, rather solid, slightly shining, straw-colored or light russet; regularly obliquely costulate-striate, the sculpture becoming obsolete in the center of the base; spire a little more depressed than in H. bayamensis, and whorls somewhat less convex above, the last slopingly flattened on the upper surface and somewhat so beneath, much dilated transversely, suddenly deeply deflected to the aperture, and tinged with orange-russet just behind

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the peristome; aperture extremely oblique, truncate-oval, rather small; peristome a trifle expanded, thickened within, white, heavy, upper and outer margins arcuate, baso-columellar margin straight, contracted by a white plate-like callus within, the upper edge of which is slightly calloused near the insertion, and decidedly truncate at its junction with the outer lip.

Alt. 21, diam. maj., 34, min. 26–27 mill.

Guantanamo, etc., Eastern Cuba.

H. guantanamensis Poey, *Memorias*, ii, p. 27, t. 3, f. 8, 9. (1856.) —Pfr., *Novit. Conch.*, p. 186, t. 50, f. 7–9.—*H. proboscidea* Pfr., *Malak. Bl.*, 1856, p. 44. and *Novit. Conch.*, p. 204, t. 54, f. 1–3. (*H. porcina* Gutierrez *mss. teste* Pfr.)

I do not know which of the two names given in the above synonymy has priority; both were published in 1856. The species may be separated from H. bayamensis by the differences indicated under that species. The more prominent characters of this form are the transversely dilated shape of the last whorl, which is compressed for its first half, its latter half quite full and dilated; the fine, regular sculpture, continued upon the base almost to the center; and the truncate callus of the lower margin of the aperture. There is a small form which measures only about 25 mill. diam. The above remarks apply to the typical form; the following seems to be merely a variety.

Var. proboscidea Pfeiffer. Pl. 2, figs. 10–12; pl. 1, figs. 10–13.

Smoother than the type, finely striate; last whorl very much dilated transversely; aperture subhorizontal, the basal margin with a heavier plate of callus within than the typical guantanamensis.

Alt. 20, diam. maj. 35, min. 28 mill.

H. rangelina Pfeiffer. Pl. 2, figs. 4–6; pl. 32, figs. 56, 57.

Imperforate, depressed conoidal, solid, yellowish straw-colored, finely, regularly, costulate-striate, striæ simple, smooth, not bifurcating, the base smoother, glossy; spire low-conical, apex obtuse, first 1½ or 2 whorls smooth, whitish; sutures impressed; body-whorl convex, transversely dilated, rather tumid beneath on its latter half, deeply deflexed anteriorly; aperture subhorizontal, truncate-oval, rather small; peristome expanded, not brown outside, much thickened within and on its face; baso-columellar margin horizontal, very broad, contracting the aperture by a plate-like callus within, which in fully adult individuals bears an inflected emargination or

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blunt tooth near the insertion, and is broad and conspicuously truncate where the base joins the outer lip.

Alt. 24, diam. maj. 36, min. 28 mill.

H. rangelina PFR., *Malak. Bl.*, 1854, p. 157, 189, t. 2, f. 1–3. and *Novit. Conch.*, p. 184, t. 50, f. 1–3.

This is a well-marked species, quite distinct from the preceding and following forms. The shape is usually more conical than the figures on pl. 2 show it. The base of the aperture bears a very heavy callus plate, which is strongly truncate at its outer termination, and in adults bears an incurved obtuse tooth near the insertion. The face of the peristome in old specimens is very convex and heavy. The aperture is often more oblique than the figures show it.

H. TRINITARIA Gundlach. Pl. 17, figs. 38–42, 42, 43

Imperforate, depressed-conoidal, straw-colored, finely obliquely costulate-striate, the costulæ smooth, not bifurcating, interstices smooth or nearly so, the base smooth, glossy; spire low conoidal, apex obtuse, smooth, sutures well impressed; whorls 4, moderately convex, rapidly increasing, the last rounded, somewhat tumid beneath, rather abruptly, deeply deflected anteriorly; aperture extremely oblique, truncate-oval; peristome expanded, thickened; baso-columellar margin straight, flat, with a blunt tooth near the insertion of the collumella; not truncated below, passing into the outer margin in a curve. Alt. 24, diam. maj., 35, min, 29 mill.

Trinidad, Cuba.

H. trinitaria GUNDL. *mss*; PFR., *Malak. Bl.*, 1858, p. 176, and *Monogr.* v, p. 287.

This species has the form, size and sculpture of H. rangelina. It differs from that form in having a narrower columellar margin, not in the least truncated where it joins the outer lip, and having above near the insertion an obtuse tooth. It is more densely finely sculptured than most specimens of H. auricoma, and has a smaller aperture; and trinitaria is different also, in the distinct tooth near the insertion, the only projection on the upper edge of the baso-columellar margin.

H. BARACOENSIS (Gutierrez) Poey. Pl. 2, figs. 13–15.

Imperforate, depressed, rather solid, straw-colored or russet, nearly lusterless above, shining beneath; spire short, low-conical, first 1½ whorls white, glossy, the remainder coarsely costulate-striate, interstices more or less transversely wrinkled or rugose, the costulæ

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rather separated, rough, irregular, frequently anastomosing, at the periphery always bifurcating, so that there are about double as many striæ on the base as there are costulæ above; the sculpture becoming obsolete in the center of the base, which is glossy. Whorls 3½ to 4, rapidly increasing, the last oblong, transversely dilated, abruptly descending and gibbous behind the aperture; aperture extremely oblique, small, truncate-oval; peristome expanded, heavy, thickened inside and on its face, upper and outer margins arcuate, basal margin horizontal, straight, bearing a slightly prominent obtuse tooth near the insertion of the columella.

Alt. 17, diam. maj. 29, min. 22 mill.; alt 20, diam. maj. 34, min. 27 mill.

Jurisdictions of Baracoa, Guantanamo and Holguin, E. Cuba.

H. baracoensis GUT. in POEY, *Memorias*, ii, p. 26 (1856–58.)—PFR. *Monogr.*, iv, p. 217.—ARANGO, *Fauna Mal. Cub.*, p. 71.—*H. lamellicosta* (GUNDL.) PFR., *Malak. Bl.*, vii, 1861, p. 220, and *Novit. Conch.* p. 185, t. 50, f. 4–6.—ARANGO, *Fauna, etc.*, p. 71.

Diagnostic characters of this form are the depressed shape and rugose sculpture. The costulæ are generally irregular and vermiculate, but even when nearly straight, they always bifurcate at the periphery. Large coarsely sculptured specimens are called by Pfeiffer and authors *H. lamellicosta* (*vide* fig. 15). But this form is not even varietally distinct. Several specimens before me do not exceed 20 mill. in diam.; this small form is usually less rugose than the types, but may be known by the bifurcating costulæ, and the conformation of the basal lip, which is also a very constant character, never being notched or truncate at the outer base as in H. guantanamensis, a species of similar depressed, oblong form and inhabiting the same districts.

Section PARTHENA Albers.

Parthena ALB., *Die Heliceen*, p. 112 (1850.)—*Leiostoma* SWAINS. *Malacol.*, p. 328, 1840 (not *Leiostomus* Lacépède, *Hist. Nat. Poiss.* iv, p. 439, 1802.)—*Helicogena* FER., in part.—*Eurycratera* BECK, *Index*, p. 45. (1837) in part; and of most authors.—*Leiocheila* ALBERS, *Die Heliceen*, p. 109 (type H. jamaicensis)—*Liochila* v. MART., *l. c.* ed. 2, p. 146. (1861).

The synonymy of many subgeneric names of Helices is involved in almost inextricable confusion; and the case under consideration is probably as intricate as any. The generally-accepted name,

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Eurycratera, was proposed by Beck in 1837, without a line of definition. His list of species commences with H. falconeri Rve. The remaining twelve species belong to nearly as many distinct groups. *Helicogena* of Ferussac comprises most of the globose Helices, commencing with H. aperta Born, a species of *Pomatia*. The type of Swainson's *Leiostoma* is H. cornumilitaris, but the name is preoccupied. Finally, *Parthena* Albers has for its first species, H. angulata Fér.; so that, although he follows this species with a list of four more belonging to four different groups, we may consider angulata the type of the section.

The species are mostly large; they are confined to Hayti and Porto Rico with the exception of H. jamaicensis. The subdivisions indicated in the text are founded upon characters of but slight importance, but they are natural groups.

* * *

Shell with light ground-color, variegated with darker spiral lines and stripes, sometimes unicolored.

H. ANGULATA Ferussac. Pl. 6, fig. 55.

Imperforate, depressed and almost flat above, very turgid beneath, acutely carinated, fragile, covered by a very thin straw-colored cuticle, obliquely striate, densely but very obsoletely granulate; spire composed of 3 nearly flat whorls; base extremely turgid about the middle; aperture subrhomboidal, large, scarcely oblique; peristome narrowly reflexed, upper and outer margins nearly straight, angled at their junction at the periphery; basal margin arcuate.

Alt. 20, diam. maj. 45, min. 32 mill.

Porto Rico.

H. angulata FER., *Hist.* t. 61, f. 1, 2.—PFR., in *Conchyl. Cab.* t. 67, f. 1, 2. and *Monogr.* i, p. 297;—REEVE, *Conch. Icon.* f. 230.—*—H. inflata* DESH., *Encyc. Meth.* ii, p. 258.—*Caracolla inflata* LAM. *An. s. Vert.* vi, p. 97.—(*Eurycratera acutangula* BECK, *Index, etc.*, p. 45, and *Discodoma inflata* SWAINS., *Malacol.*, p. 329. *teste* PFR. (Neither was described.)

H. OBLITERATA Ferussac. Pl. 6, figs. 51, 52.

Imperforate, depressed, carinated, thin, light brown, narrowly lineate or banded with umber, with oblique wrinkles of increment, the entire surface densely granulate, the granules oval or elongated; spire convex, obtuse, apex minute; whorls 4, rapidly widening,

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separated by linear sutures, at the periphery acutely carinated; base convex, turgid; aperture large, oblique; peristome narrowly reflexed, upper and outer margins curved, angulated or rounded at the position of the carina; basal margin arcuate, adnate to the base at the umbilical region. Alt. 27, diam. maj. 43, min. 36 mill.

Porto Rico.

H. obliterata FER., *Hist.* t. 61. f. 3, and *Prodr.*, p. 136.—PFR., in *Conchyl. Cab.*, t. 67. f. 3.—REEVE, *Conch. Icon.*, f. 231.

Allied to the preceding species, but more coarsely granulose, less acutely carinated and more convex above.

H. ANGUSTATA Ferussac. Pl. 7, figs. 67, 68.

Imperforate, depressed, carinated, nearly equally convex below and above the carina, rather solid, light corneous or yellowish, closely spirally marked with minutely undulating chestnut lines, lighter beneath; under a lens seen to be *very minutely* granulate on the inner whorls, the outer whorl near the carina above and below densely indented or pitted; spire convex, obtuse; whorls 3½ to 4, rapidly widening, the penultimate nearly as wide as the last whorl; body-whorl compressed in front, but becoming turgid on its latter half, carinated, a trifle deflected toward the aperture; aperture very oblique, truncate-oval; peristome well reflexed, somewhat thickened, upper and lower margins slightly curved, outer lip arcuate; baso-columellar margin wide, thickened within, especially toward its insertion. Alt. 18, diam. maj. 30, min. 25 mill.

Hayti.

H. angustata FER., Hist., t. 61, f. 1, and *Prodr.* 133.—PFR., *Symb.* iii, p. 74; *Monogr.* i, p. 299.; *Conchyl. Cab.* t. 112, f. 1, 2.—REEVE, *Conch. Icon.* f. 216.

This form is related to the following species in its oblique aperture, solidity, coloration and rugose or malleated sculpture at the periphery; from them it may be separated by the more depressed form and carination

H. DOMINICENSIS Pfeiffer. Pl. 17, figs. 50, 51.

Imperforate, globose-depressed, thin or moderately solid, cuticle thin, straw-colored, encircled at the periphery by a narrow chestnut band, and frequently with numerous lines and bands of white whence the cuticle has been removed; surface lightly obliquely striate, and densely obliquely malleate, especially upon the penultimate

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whorl; spire short, apex obtuse, white; sutures scarcely impressed until the last whorl; whorls 4, rapidly widening, the last either subangulate or rounded in front of the aperture, always swollen and rounded on its latter half, slightly descending anteriorly; aperture wide-lunar, oblique; peristome reflexed all around, its upper and outer margins arcuate, the baso-columellar margin somewhat straightened, wide, flat, inner edge a little concave, not dentate.

Alt. 28, diam. maj. 40, min. 33 mill.

Hayti.

H. dominicensis PFR., *Zeitschr. f. Mal.*, 1850, p. 71, and *Conchyl. Cab.*, t. 133, f. 14, 15.—REEVE, *Conch. Icon.* f. 215—*H. extensa* PFR., *Monogr.* i, p. 257 and *Conchyl. Cab.* t. 120, f. 16, 17 (not *H. extensa* Müll. nor Fér.)

This form is never, even when carinated, so depressed and lens-shaped as H. angustata, nor, on the other hand, is it ever so globose as H. undulata. Its more prominent characters are the depressed form, oblique malleation of the antepenultimate whorl, single peripheral brown fascia, and (usually) numerous bands denuded of the cuticle. The peristome is well-reflexed, as in the H. angustata, and is decidedly wider than in H. undulata etc. The typical form has a rounded body-whorl. The form which Dr. Pfeiffer at first indentified as "H. extensa" differs in being decidedly carinated in front of the aperture. It is intermediate between H. angustata and the present species. (Pl. 17, fig. 45).

H. DISSITA Deshayes. Pl. 6, fig. 60.

Subglobose, depressed, smooth or striate, rugose, white, under a brownish deciduous epidermis, encircled by distant narrow brown lines; spire short, obtuse; whorls 4½, moderately convex, the last thickened, convex, imperforate, extended at the aperture; aperture white, ovate-lunar, oblique, peristome thickened, reflexed, base callous. Alt. 33, diam. 50 mill. (*Desh*).

Hayti.

H. dissita DESH., in Fer. et Desh., *Hist*, p. 248, t. 16, f. 1, 2.—PFR., *Monogr.* iii, p. 185; v, p. 284.

This species was apparently known to Pfeiffer only from the original description, which I have translated above. I have identified with it a suite of shells from San Domingo collected by GABB, which may be described as follows: (pl. 17, figs. 46, 47.)

Imperforate, depressed-globose, rather solid or thin, straw-colored,

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tinged with brownish, sometimes with a narrow, faint peripheral fascia; obliquely marked with incremental wrinkles; sutures a little more impressed than usual in H. dominicensis; whorls 4, shaped as in H. dominicensis; aperture wide-lunar, oblique, peristome well reflexed, basal margin wide, slightly concave.

Alt. 27, diam. maj. 40, min. 32 mill.; alt. 22, diam. maj. 31, min. 25 mill.

The last-described form agrees with H. dominicensis in form, coloration (except that the peripheral fascia is fainter), in the *excessively minute* granulation of the whole surface, seen only under a strong lens, and in the characters of the aperture. It differs from that species in lacking the conspicuous malleation of the surface,—which in dissita is smooth or only *very obsoletely* malleated,—and it shows no traces of zones denuded of cuticle.

H. UNDULATA Férussac. Pl. 6, figs. 53, 54.

Imperforate, globose, rather thin, straw-colored, encircled by very numerous, dense, minutely undulating or zigzag chestnut lines; obliquely striate; spire short, rather conoidal, apex obtuse, white; inner whorls densely microscopically granulated; whorls 4½–5, moderately convex, separated by impressed sutures, the last globose, a trifle descending anteriorly; aperture large, rotund-lunar, bluish within; peristome narrowly expanded, thickened, outer lip arcuate, upper and columellar margins a little curved, the latter dilated and adnate at the umbilical region.

Alt. 42, diam. maj. 44, min. 37 mill; alt. 28, diam. 30 mill; alt. 50, diam. 50 mill.

Hayti.

H. undulata FER., *Prodr.*, 25, *Hist.* t. 16, f. 3–6.—PFR. in *Conchyl. Cab.*, t. 5, f. 3, 4.—REEVE, *Conch. Icon.*, f. 212.—*H. lineolata* LAM. *An. s. Vert.* vi, p. 67.—*H. crispata* FER., *Prodr.* 26, *Hist.* t. 25, f. 7, 8.—PFR. *Symb.*, iii, p. 65; *Monogr.* i, p. 23; *Conchyl. Cab.* p. 225, t. 28, f. 1, 2.—REEVE, f. 217.

The shell is much more globose than that of H. dominicensis and H. dissita, and is more or less densely lineolate with brown. The peristome is narrower than in either of the species named, and the whorls more numerous. The measurements given above show the great variation in size to which the species is subject. *H. crispata* Fer. does not seem to have sufficiently tangible or stable characters to be retained as a separate variety. (Pl. 7, figs. 65, 66.)

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H. DILATATA Pfeiffer. Pl. 19, figs. 55, 56.

Imperforate, globose or bubble-shaped, thin, light yellow or yellowish-brown, unicolored (save for oblique brownish streaks), or encircled by few or numerous fine undulating or broken lines of brown; surface apparently nearly smooth, with slight incremental wrinkles, but under a lens the penultimate and part of the last whorl are seen to granulate, the granules not extending far below the suture, wanting on the middle and base of the body-whorl; spire short, small, apex obtuse, whitish; whorls 3½ to 4, rapidly increasing, the last very wide, globose, gently and very slightly descending anteriorly; aperture large, rounded-oval; peristome narrow, a trifle thickened, upper, outer and basal margins nearly equally curved, columella concave, inserted vertically, dilated.

Alt. 27, diam. 28–30 mill.

Hayti.

H. dilatata PFR., *P. Z. S.* 1845, p. 42, and *Conchyl. Cab.* t. 152, f. 13, 14.—REEVE, *Conch. Icon.* f. 213.

This shell has the form of H. (Pomatia) aperta of Southern Europe. The aperture is larger than in H. undulata, the columella inserted more vertically, and the whole shell more bubble-like. Like the preceding several species, this form is seen under a strong lens to be covered with a more or less distinct, *excessively minute* sculpture of oblique corrugations or granules.

* * *

Shell dark colored, generally chestnut or chocolate, with darker longitudinal streaks; not distinctly spirally fasciate.

H. CORNUMILITARE Férussac. Pl. 7, figs. 61, 62.

Imperforate, very large, depressed-globose, solid, opaque, chestnut-colored, with darker oblique streaks, and behind the aperture mahogany-colored and very glossy; the surface covered with an *excessively minute* decussation of spiral and oblique microscopic lines; spire conoidal, obtuse, whorls 5, moderately convex, the first 2 densely granulated, whitish, the remainder rather coarsely obliquely marked by wrinkles of increment, the last encircled by one or several very shallow sulci in the region of the periphery, anteriorly deflexed; aperture oblique, bluish within, rounded-subquadrate; peristome expanded, thickened within, white, upper and lower mar-

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gins parallel, the latter expanded toward the umbilical region and adnate over it; parietal wall covered by a translucent callus.

Alt. 50 diam. maj. 68, min. 55 mill.; alt. 45, diam. maj. 70, min. 56 mill.; alt. 32, diam. 48 mill.

Hayti.

H. cornumilitare FER., *Hist.* t. 15, f. 5–7.—*H. cornumilitare* "Linn." of Pfeiffer and authors, not of Linné.—*H. gigantea* LAM., *An. s. Vert.* vi, p. 65 (1819) and other authors.

The large size and deep color of this species will separate it from other Helices of San Domingo.

The *H. cornumilitare* of Linnæus is a *Caracolus*, probably either H. excellens or H. angistoma. Strict adherence to the principles of nomenclature would compel us to call this species *H. gigantea;* but I have preferred the better-known name.

VAR. AUDEBARDI Pfeiffer. Pl. 6, fig. 59.

Imperforate, globose-conoidal, rather solid; similar to H. cornumilitare in sculpture, whorls and coloration, but smaller, lighter colored, never so dark behind the aperture. The spire is more elevated than H. cornumilitare; the peristome is narrower, and the aperture not so wide. The microscopic granulation is more effaced than on most specimens of the former species.

Alt. 37–40, diam. maj. 47, min. 37–38 mill.

Hayti.

H. audebardi PFR. *P. Z. S.* 1851, p. 147.—REEVE, *Conch. Icon.*, f. 211. (1851)—PFR. in *Conchyl. Cab.*, t. 131, f. 20, 21; and *Monogr.* iii, p. 186.

The more elevated form and lighter coloration are the principal characters separating this form from H. cornumilitare. Pfeiffer mentions a "var β, major, perist. latiore; diam maj. 70, min. 58, alt. 45 mill." which must be identical with, or very near to cornumilitare.

H. LUQUILLENSIS Shuttleworth. Pl. 7, figs. 63, 64.

Imperforate, conoidal, elevated, solid, opaque, lusterless, chocolate-colored, or sometimes chestnut; surface apparently smooth save for oblique incremental wrinkles, but under a strong lens seen to be covered all over with an excessively minute, dense, and beautifully regular granulation; spire conical, elevated, obtuse and whitish at apex; sutures at first linear, becoming impressed; whorls 5½, the first 3 scarcely convex, the following convex, sometimes swollen just

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beneath the sutures, and paler there, rounded or flattened at the periphery, and showing trace of a carina, sometimes very obsoletely spirally sulcate on the base; aperture quite oblique, slightly deflected above, bluish within; peristome expanded, white; columella oblique, rather wide, dilated and adnate at the place of the umbilicus.

Alt. 34, diam. maj. 35, min. 31 mill.; alt. 30, diam. maj. 35 mill.

Sierra de Luquillo, Porto Rico.

H. luquillensis SHUTT, *Diagn. n. Moll.*, 6, p. 132 (1854)—REEVE, *Conch. Icon.*, f. 1274.—PFR., *Monogr.*, iv, p. 207.

Smaller than the preceding forms, with higher spire more distinct sculpture, etc.

* * *

Shell large, globular, dark-colored, with a few broad light bands; whorls few; aperture very large. (*Liocheila.*)

H. JAMAICENSIS Gmelin. Pl. 5, figs. 48–50.

Imperforate, large, globose, solid, opaque, slightly shining, light chestnut-brown or olive-brown to chocolate colored, with one to three ill-defined light yellowish spiral bands about the middle of the whorl, spire and apex purplish, first two whorls smooth, glossy, the remainder lightly wrinkled by growth-lines and covered with a fine, dense, very oblique corrugation; spire short, apex obtuse; whorls 3½, the last very large, globose, gently descending anteriorly; aperture large, oblique, irregularly oval, livid and showing lighter bands within; peristome thickened, subexpanded, pinkish, columella slightly concave, white at the insertion, dilated over the umbilical and parietal tracts. Alt. 50–53, diam. 55 mill.

Jamaica.

H. jamaicensis GMEL., *Syst. Nat.* xiii, p. 3644.—FER., *Hist.*, t. 9 B, f. 10, t. 14, f. 6–9; and of authors generally.—(*H. pulla* GMEL., *Syst. Nat.* xiii, p. 3650 ?).

A well-known species, of somewhat uncertain systematic position. It seems to me more nearly allied to Parthena than to Thelidomus.

Group XIII. CARACOLUS Montf. (*sensu latiore.*)

The group *Caracolus*, in the broad sense in which that name is used here, consists of about ten sections, which are not only similar in shell-characters, but also in anatomy, as far as is known. The shell is generally large, orbicular, dark colored, with a tendency to be carinated in all of the sections, although many species are round-

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ed on the periphery. The axis is perforated, but generally closed in the adult by the expansion of the columellar lip. The whorls number from 4 to 6, and are usually quite gradual in increase. The aperture is usually wider than high; peristome expanded, more or less thickened, frequently bearing tubercular or lamellar teeth; and in Isomeria, Labyrinthus and some forms of Dentellaria, the parietal wall also developes a tooth.

I am altogether disposed to unite with this group the sections I have separated under the name *Thelidomus*,—viz. Thelidomus and Parthena, with Polydontes, which is closely allied to the last-named section. The essential identity of the two groups did not impress me when preparing several months ago the part of the MANUAL, containing Thelidomus. The sections are numbered continuously from *Thelidomus*, p. 56.

With the addition of Oxychona, the group as here constituted is synonymous with Fischer's subgenus *Caracolus*.

The species of the various sections of Caracolus are distributed throughout the West Indies and mainland of America from Brazil and Peru to Central America.

Synopsis of Sections.

Section III. POLYDONTES Montfort, 1810.

Shell large, depressed, imperforate or narrowly umbilicate, solid, heavy; surface microscopically decussated; whorls 4½–5, the last slightly deflected anteriorly, carinated or rounded; aperture oblique; peristome expanded, thickened, heavy, simple or with tubercular obtuse teeth, columellar margin bearing an obtuse fold near its insertion. Type, H. imperator Montf.

Cuba.

Section IV. DENTELLARIA Schumacher, 1817.

Shell imperforate, solid, globose-depressed or conical-depressed, often carinated, opaque, generally minutely granulated; whorls 5 or less, slowly widening; spire convex; aperture transverse, wider than high, oblique; peristome more or less expanded, thickened; basal lip usually toothed. Type, H. nuxdenticulata Chem.

Lesser Antilles.

Subsection GONOSTOMOPSIS Pilsbry, 1889.

Shell narrowly umbilicated, rather thin, opaque, hirsute; spire depressed; body-whorl rounded, depressed; aperture as high as

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wide, oblique, trilobate-lunar; peristome narrowly expanded, outer and basal margins each with a tooth. Type, H. auridens Rang.

Martinique.

Section V. CEPOLIS Montfort, 1810.

Shell imperforate or narrowly umbilicate, depressed or globose-depressed, opaque, striate or rugose, spire convex, low; whorls 4½ to 5, the last rounded or angular at periphery, deeply deflexed anteriorly, and with a dent or scrobiculation a short distance behind the peristome on the periphery, producing a fold or tooth inside the shell; aperture oblique; peristome expanded, generally toothed below. Type, H. cepa Müll.

Hayti; Porto Rico.

Subsection AVERELLIA Ancey, 1887.

Shell broadly umbilicated, depressed, rather thin; spire concave; body-whorl rounded, very deeply deflexed anteriorly, scrobiculate behind the peristome above and below; aperture subhorizontal, biplicate inside; peristome narrowly expanded. Type, H. macneili Crosse.

Central America.

Subsection ANGRANDIELLA Ancey, 1887.

Shell broadly umbilicated, depressed, subdiscoidal; spire convex, low; body-whorl rounded, depressed, descending anteriorly; deeply scrobiculate on the base behind the aperture; aperture very oblique, oval, with a dentiform fold within the baso-columellar margin; peristome expanded. Type, H. angrandi Morel.

Andes of Peru.

Section VI. LUCERNA Swainson, 1840.

Shell imperforate or umbilicate, depressed or depressed-globose, usually more or less carinated at periphery, solid, opaque, brown, densely granulated, the granules arranged in close series like incremental striæ; spire more or less convex, obtuse; apical whorl planulate; whorls 4½ to 6, very gradually widening, the last more or less deflexed anteriorly, generally scrobiculate behind the peristome; aperture oblique or subhorizontal; peristome broadly expanded, edentulate or bearing 1 to 5 teeth (which are usually pliciform and entering) inside; parietal wall with more or less callus, never dentate. Type, H. acutissima Lam.

Jamaica.

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Section VII. CARACOLUS Montfort, 1810.

Shell depressed, orbicular, carinated, imperforate or narrowly umbilicate, thick, solid, opaque; spire conical, apex obtuse; suture scarcely impressed; whorls 5 to 6, gradually widening; the last slightly or not at all deflexed anteriorly; aperture transverse, oblique, wider than high; peristome expanded or narrowly reflexed on the basal margin, its terminations remote; aperture not toothed within. Type, H. caracolla L.

Cuba.

Section VIII. OXYCHONA Mörch, 1852.

Shell conically elevated or depressed, imperforate or umbilicate, acutely carinated or rounded at the periphery, rather thin and light, white with spiral brown zones; spire conical or depressed, apex subacute; sutures linear; aperture oblique, generally wider than high; outer and basal margins of the peristome expanded, thin; aperture not toothed within. Type, H bifasciata Burrow.

Mexico to Brazil.

Section IX. ISOMERIA Albers, 1850.

Shell depressed, orbicular, rounded or obtusely carinated on the periphery, imperforate or umbilicate, solid, generally dark-brown in color, without spiral bands; spire depressed, convex, formed of 5 or fewer slightly-convex whorls; the last whorl deflexed or not anteriorly; aperture rounded subquadrangular, transverse, very oblique, wider than high; peristome expanded or reflexed, somewhat thickened, generally bearing small acute teeth, of which one is usually at the position of the periphery; terminations of peristome remote, joined by a parietal callus; parietal wall after bearing a small oblique and slightly elongated denticle. Type, H. oreas Koch.

Northern South America.

Section X. LABYRINTHUS Beck, 1837.

Shell umbilicate, depressed, orbicular, carinated, solid or thin, brown; spire as in Isomeria; last whorl descending anteriorly, constricted behind the peristome; aperture subhorizontal, transverse, broader than high, obstructed by teeth; peristome expanded or reflexed all around, continuous across the parietal wall, the basal margin bearing at least two strong teeth, parietal wall with a long, entering lamellar tooth. Type, H. labyrinthus Chem.

Northern South America.

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Section III. POLYDONTES Montfort, 1810.

Polydontes MONTF., Conch. Syst. ii, p. 154, and of authors.

This section seems to be much more closely allied to Thelidomus and especially Parthena than to Caracolus, and should have been placed in the preceding group. I now place it here because it was omitted in the synopsis of sections on p. 56. The animal has not been observed.

Key to species of Polydontes.

Peristome toothed within,	*imperator.*
Peristome not toothed,	
Periphery strongly carinated,	*apollo.*
Periphery very obtusely carinated or rounded,	*sobrina.*

H. IMPERATOR Montfort. Pl. 9, figs. 80–83, 87.

Imperforate or narrowly umbilicate, depressed, heavy, thick, solid, opaque, nearly lusterless, yellow, densely obliquely streaked with light chestnut, and with very numerous but inconspicuous spiral lines of the same above; surface with rather coarse irregular wrinkles of increment, and under a lens seen to be covered with an excessively minute decussated sculpture; spire low-conical; whorls 5; body-whorl depressed, carinated, a trifle descending anteriorly; aperture oblique, bluish-white within; peristome flesh-colored, very heavy and thick, expanded, its face convex, bearing on the inner margin numerous tubercular teeth; umbilicus closed by the expanded baso-columellar lip or open; parietal wall bearing a heavy callus. Alt. 30, diam. 60; alt. 22, diam. 50 mill.

Jurisdiction of Baracoa, Cuba.

Polydontes imperator MONTF. Conch. Syst. ii, p. 155.—*H. imperator* PFR., Monogr. i, p. 302; Novit. Conch. iii, p. 369, t. 85, f. 1–6, t. 86, f. 1–6.—REEVE, Conch. Icon. f. 757.—FERUSSAC, Hist., t. 52, f. 4; t. 52 B, f. 1–3.—ARANGO, Fauna Mal. Cubana, p. 75.—*H. magica* FER. Hist. t. 54 A, f. 7–9. PFR., Monogr. i, p. 302.

A fine large species, unlike any other. If anything like Férussac's *H. magica* (pl. 8, figs. 77–79) ever existed, it may have been a form of H. imperator.

H. APOLLO Pfeiffer. Pl. 9, figs. 84–86.

Imperforate, depressed, very solid, opaque, lusterless, above, shining below; clear yellow, or with russet spiral lines above; surface

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covered with an excessively minute decussated sculpture, the inner whorls granulated; spire low-conical, apex obtuse; whorls 4½, rapidly widening, the last strongly carinated, slightly descending anteriorly; aperture quite oblique, white within; peristome expanded, thickened, white, not toothed within, but bearing an obtuse fold near the columellar insertion. Alt. 22–23, diam. 46–51 mill.

Yunque de Baracoa, Eastern Cuba.

H. apollo PFR., P. Z. S. 1860, p. 133, t. 50, f. 9; Monogr. v, p. 309; Novitates Conch. iii, p. 389, t. 90, f. 1–8.—ARANGO, Fauna Mal. Cubana, p. 74.—*H. imperatrix* Gundl. (*olim*) Journ. de Conchyl. 1860, p. 228.

H. SOBRINA Férussac. Pl. 8, figs. 72–76.

Imperforate, depressed-subglobose, solid, heavy, opaque, yellowish, densely marked with dark chestnut or blackish finely-undulating lines and streaks, which cover nearly the entire surface; sculpture as in H. apollo; spire convex, apex obtuse; apical 2½ whorls whitish; whorls 4½, scarcely convex, rapidly widening, the last globose-depressed, bluntly angular in front, becoming rounded, descending anteriorly; aperture quite oblique; peristome expanded, heavy, white, thickened, its face convex, without teeth, but with an obtuse fold near the columellar insertion; expanded and adnate over the umbilicus. Alt. 25, diam. 43 mill.

Jurisdictions of Santiago de Cuba, Mayari, Baracoa, and Guantanamo, Cuba.

H. sobrina FER., Hist. t. 43, f. 6.—PFR., Monogr. i, p. 264.—REEVE, f. 1388.—*H. crassilabris* PFR. P. Z. S. 1846, p. 111; Monogr. v, p. 287.

A very large, thick and ponderous fossil form is figured on pl. 8, figs. 75, 76. Specimens measure, alt. 30–32, diam. 50–54 mill.

This species differs from H. apollo in being less carinated and darker in color.

Section IV. DENTELLARIA Schumacher, 1817.

Dentellaria SCHUM. Essai d'un nouv. Syst. Test., p. 230.—BECK, Index, p. 34.—MORCH. Cat. Yoldi, p. 11.—ALBERS, Die Heliceen (1850), p. 123.—ALBERS-MARTENS, Die Heliceen, p. 151 (1860).—H. & A. Ad. Gen. Rec. Moll. ii, p. 200.—*Lucidula* SWAINSON, Treatise on Malac., p. 329.—*Lucidella* SWAINS., l. c. p. 330.

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A well-characterized section, allied to Lucerna and Cepolis. The species are well-defined and easy to recognize; and transition forms are rare. A number of South American species belonging to Isomeria have been referred here erroneously by several recent authors. The species all inhabit the Caribæan islands. Swainson's subgenus *Cyclodoma* (Malacol. p. 193) does not belong in the synonymy of Dentellaria, where Pfeiffer places it, but probably equals in part Ochthephila and Polygyra.

Key to the species of Dentellaria.

Teeth of basal lip tubercular, not compressed nor entering, position of tooth not marked behind the peristome by a pit or groove; peristome sometimes without teeth.

Parietal wall toothed,
- Outer lip bidentate; basal lip denticulate, *nuxdenticulata.*
- Outer lip not dentate,
  - Basal lip with one or two teeth,
    - Parietal tooth long, triangular, *nucleola.*
    - Parietal tooth short, tubercular, *obesa.*
  - Basal lip without teeth, *parilis.*

Parietal wall not toothed,
- Parietal callus microscopically granulate,
  - Shell large, peristome toothless, *orbiculata.*
  - Shell smaller, basal lip toothed, *dentiens.*
- Parietal callus smooth, *isabella.*

Basal lip with a compressed entering tooth near its junction with the outer lip, marked behind the peristome by a groove or scrobiculation.

Surface granulate, whorl deflexed at aperture,
- Granulation minute,
  - Color light, with dark bands, *josephinæ.*
  - Color dark, bands obscure or wanting,
    - Acutely carinated, large, *lychnuchus*
    - Obtusely carinated, small, *badia.*
- Granulation coarse,
  - Acutely angulated, *perplexa.*
  - Periphery rounded, *formosa.*

Surface smooth, not granulate, whorl not deflexed,
- No parietal tooth, *pachygastra.*
- A strong parietal tooth, *nigrescens.*

Surface hispid; umbilicus not covered, *auridens.*

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H. NUXDENTICULATA Chemnitz. Pl. 29, figs. 39–41.

Imperforate, globose, solid, opaque, dark chestnut brown, with a light yellow peripheral line; surface obliquely corrugated by fine, close, obliquely descending wrinkles, crossed by rather irregular lines of increment; spire low, very obtuse; whorls 5, the inner not convex, yellowish-brown, very minutely granulated; last whorl much dilated and gibbous on its latter half, especially beneath, constricted behind the peripheral part of the peristome, deeply and abruptly deflexed above; aperture oblique, irregularly lunar; peristome flesh-colored or white, thick, convex, outer margin expanded, inside bearing two strong teeth projecting into the aperture; basal margin reflexed and adnate to the base and over the umbilicus, its inner edge irregularly denticulate; terminations of peristome remote, but joined by a heavy ridge of callus across the parietal wall, which bears a large tongue-shaped erect process, extending a little within the aperture. Alt. 20, diam. 22 mill.; alt. 15, diam. 19 mill.

Martinique and Guadeloupe Is.

H. punctata BORN, *Test. Mus. Cæs. Vindob.* p. 372, t. 14, f. 17, 18. PFR. in *Conchyl. Cab.* t. 21, f. 6, 7; *Monogr.* i, p. 306.—*H. nuxdenticulata* CHEMNITZ, *Conchyl. Cab.* ix, p. 275, f. 2055, 2056 (1795). FER. *Hist.* t. 49, f. 3, 4; and of most authors.—*H. hippocastaneum* LAM. *Journ. d'Hist. Nat.* t. 42, f. 3.—*Chenu, Ill. Conch.* t. 10, f. 3, and of others.—*Dentellaria nuxdenticulata* W. G. BINN. *Ann. N. Y. Acad Sci.* iii, p. 111 (jaw and dentition).

The name *punctata* Born has priority, but is used for a well-known European Macularia.

H. NUCLEOLA Rang. Pl. 28, figs. 16, 17, 21.

Imperforate, globose-depressed, solid, opaque, yellowish-chestnut or light olive-brown, with two dark chestnut bands, which sometimes cover all the surface but a median peripheral light line; surface shining, obliquely striate; spire low, rounded, very obtuse; whorls 5, the inner ones scarcely convex, not lighter colored than the outer; sutures linear, becoming impressed at the last whorl; body-whorl depressed, rounded or subangular at the periphery, constricted behind the peristome, deflexed toward the aperture. Aperture oblique, broad-lunar; peristome heavy, convex, purplish or bluish; outer margin slightly expanded, basal margin broadly reflexed, bearing two denticles within, the inner often obsolete; terminations

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of peristome remote, connected by a heavy callus, which bears a triangular tooth. Alt. 11, diam. 17 mill.

Martinique.

H. nucleola RANG, in Guérin's *Mag. de Zool.*, 1834, t. 57.—PFR. in *Conchyl. Cab.* p. 350, t. 62, f, 5–7; *Monogr.* i. p. 306.—REEVE, f. 277—*H. nux-denticulata* FER. var. B, t. 49, f. 1.—*H. crassidens* PFR. *P. Z. S.* 1854, p. 148; *Monogr.* iv. p. 242; v. p. 312.—REEVE, f. 1364.—*Dentellaria nucleola* W. G. BINNEY, *Ann. N. Y. Acad. Sci.* p. 111 (jaw and dentition).

Smaller than H. nuxdenticulata, without oblique wrinkles, and with different armature of the outer lip. *H. crassidens* Pfr. (fig. 21) is founded on specimens with the two lip-teeth subequal.

H. PARILIS Férussac, Pl. 29, figs. 22–24.

Imperforate, depressed-globose, solid, opaque, shining, brown or yellowish, with two encircling dark bands often ill-defined, and numerous *irregular, zigzag, bright golden markings;* surface marked by incremental striæ and *obliquely descending fine dense wrinkles,* which are concentric on the base; spire low, rounded, very obtuse; apex flat; suture linear; whorls 4, penultimate nearly as wide as the last; body-whorl commencing subcarinate, becoming rounded, gibbous and then constricted behind the aperture, deflexed above; aperture very oblique, transverse, oblong or trilobed; peristome heavy, convex, brownish, outer lip bearing above a more or less developed callus or tooth, basal margin thickened within but *not toothed;* terminations of the peristome remote, the upper one produced downward upon the parietal wall in a tubercular tooth, and connected with the columellar end by a slightly thickened callus.

Alt. 10, diam. 17 mill.

Guadeloupe and Martinique.

H. parilis FER. *Hist.* t. 49, f. 2.—WOOD, *Ind. Test.* Suppl. t. 7, f. 49.—PFR. *Symbolæ* i, p. 37; *Conchyl. Cab.* p. 351, t. 62, f. 8–10; *Monogr.* i, p. 308.—*H. pseudoparilis* GRATELOUP, *Actes Soc. Linn. Bord.* xi, 1837, p. 403, t. 1, f. 17, 18.—PFR. *Monogr.* i, p. 308.

Obliquely wrinkled like H. nuxdenticulata, but smaller, with different peristome and variegated coloration.

H. pseudoparilis Grat., is probably an immature specimen of this shell.

H. OBESA Beck. Pl. 27, figs. 37, 38; pl. 24, figs. 40, 41.

Imperforate, depressed, solid, opaque, somewhat shining, reddish-brown above, light greenish-yellow beneath; surface marked by in-

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cremental wrinkles, and under a lens showing nearly effaced traces of spiral sculpture; spire low, convex, very obtuse; apex flat; sutures linear, or at the last whorl slightly impressed; whorls 5, nearly flat, gradually increasing, the last usually commencing subcarinate, becoming rounded, somewhat gibbous and a trifle constricted behind the aperture, and slightly deflexed above. Aperture transverse, irregularly lunar, very oblique; peristome white, very thick and heavy, convex, a little expanded, basal margin reflexed, adnate, thickened within and bearing a tooth at the junction of basal and outer lips, its edge slightly irregular; outer margin thick, sometimes bearing a slight lobe or tooth above; terminations of the peristome joined by a callus ridge, which bears a strong, oval, tubercular tooth or lobe above, connected with the upper termination of the peristome. Alt. 12, diam. 20–23 mill.

Martinique; Guadeloupe.

H. obesa Beck, *Index Moll.* p. 35.—Pfr. in *Conchyl. Cab.* t. 62, f. 3, 4; *Monogr.* i, p. 307.—Reeve, f. 282.—*H. punctata* Fer. *Hist.* t. 48, f. 3. (not *punctata* Born, nor Müll.)

This shell is allied to H. parilis, but differs in the larger size, coloration, and the tooth on the basal lip. From H. dentiens the tooth on the upper parietal wall separates H. obesa. This tooth is often brown, while the remainder of the peristome is white. In the development of these callosities on the peristome and in the sculpture of the shell, this and the preceding species of *Dentellaria* approach the Canary Island group *Hemicycla* (H. malleata Fér. etc). There are also a number of African *Maculariæ* which have considerable resemblance to *Dentellaria* as far as the shells are concerned.

H. dentiens Férussac. Pl. 28, figs. 10–15.

Imperforate, depressed-semiglobose, solid, opaque, dark reddish-chestnut, shining, with delicate incremental marks and generally traces of spiral sculpture visible under a lens; spire more or less elevated, rounded, obtuse; apical whorl flat; suture linear, becoming impressed at the last whorl; whorls 5, scarcely convex, slowly widening; body-whorl rounded at the periphery, or commencing angular there, losing the carina toward its latter half; anteriorly deflexed, with a prominent oblique gibbosity and then a constriction toward the aperture; aperture subhorizontal, small, truncate-oblong; peristome purplish-brown, thick, heavy, convex, upper and outer margins not expanded, basal margin reflexed, adnate to the base, bearing

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within two denticles, or irregularly denticulate; upper and lower margins subparallel, terminations remote, joined by a heavy brown callus, which under a lens is seen to be very minutely granulate. The upper margin is very much thickened upon its face, often obtusely lobed. Alt. 14, diam. 23 mill.; alt. 10, diam. 18 mill.

Guadeloupe; Martinique; Cayenne.

H. dentiens Fer. *Prodr.* 88; *Hist.* t. 48, f. 2; t. 49 A, f. 2.—Wood. *Ind. Test.* Suppl. t. 7, f. 48.—Pfr. in *Conchyl. Cab.* p. 110, t. 15, f. 11–13; *Monogr.* i. p. 107.—Guppy, *Ann. and Mag. N. H.* 4th ser. i, p. 431.—*Dentellaria dentiens* W. G. Binney, Ann. N. Y. Acad. Sci. iii, p. 111.

There is a mutation which may be called var. *isabellina*, characterized by a pale greenish-yellow or an isabella color all over, the peristome and parietal wall white. Sometimes bifasciate with brown. It is from Guadeloupe.

This shell differs from H. obesa in lacking a tooth on the parietal wall at its junction with the upper termination of the peristome; from H. isabella by the gibbous ridge behind the peristome, and the granulate parietal callus and peristome. This last character is microscopic, but it holds good through the large suites of each species before me. I consider the two species perfectly distinct.

H. isabella Férussac. Pl. 24, figs. 42, 43.

Imperforate, depressed, solid, opaque, shining, obliquely striatulate, rarely showing faint traces of spiral impressed lines under a strong lens, whitish or greenish yellow, with two brown bands, which are generally wide, fading into the ground-color on their outer edges, leaving between them a narrow, well-defined peripheral light fascia; center of the base light colored. Spire low, rounded, obtuse; apical whorl flat; sutures linear, becoming impressed around the outer whorl; whorls 4½, slightly convex, slowly widening, the last subangular or rounded at the periphery, a trifle contracted behind the aperture, scarcely descending anteriorly. Aperture very oblique, oblong-lunar, transverse; peristome heavy, thick, brown or brown and white, upper and basal margins parallel, the latter thickened within, the edge of the thickening more or less irregular or subdenticulate, whitish, right margin slightly expanded, terminations of peristome joined by a smooth shining parietal callus.

Alt. 13, diam. 23 mill.; alt 11, diam. 20 mill.

Barbados; Guadeloupe; Cayenne.

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H. isabella Fer. *Prodr.* 87; *Hist.* t. 47, f. 2.—Pfr. *Conchyl. Cab.* t. 10, f. 1, 2?; *Monogr.* i, p. 307.—Drouet, *Moll. Guyane franc.* p. 54.—*H. barbadensis* "Guild." Pfr. *Monogr.* i, p. 310.—(*H. guildingi* Pfr. *olim.*)—*H. dentiens var.* Desh. in Fér. *Hist.* p. 148.—*Dentellaria isabella* W. G. Binn. Ann. N. Y. Acad. Sci. iii, p. 111, t. 9, f. *B.* (dentition.)

I have above expressed my opinion that this form is quite distinct from H. dentiens. See remarks under that species. The smaller size of H. isabella and its *smooth, not granulated*, parietal callus will separate it form H. orbiculata. It is sometimes unicolored, yellowish, or with a single narrow dark fascia.

H. orbiculata Férussac. Pl. 28, figs. 1–4.

Imperforate, depressed semi-globose, solid, opaque, shining, light yellowish brown or greenish brown, with two narrow chestnut fasciæ; obliquely striate; spire low, dome-shaped, obtuse; apical whorl flat; sutures linear except the last half of the outer, which becomes impressed. Whorls 5½, nearly flat, the last gently descending anteriorly, a little gibbous above behind the aperture; aperture oblique, oblong-lunar, transverse; *peristome expanded all around*, livid brownish, basal margin nearly straight, reflexed, broad, flattened, adnate to the base only in the vicinity of the umbilicus, not toothed within; terminations of peristome joined by a bright callus; peristome and parietal callus minutely granulate under a lens.

Alt. 16, diam. 30 mill; alt. 23, diam. 34 mill.

Martinique; San Lucia; Guiana; Cayenne.

H. orbiculata Fer. *Hist.* t. 47, f. 3, 4; *Prodr.* 86.—Pfr. *Monogr.* i, p. 265; *Conchyl. Cab.* p. 39, t. 70, f. 9, 10.—Rve, f. 251.—Bland, *Ann. Lyc. N. H. N. Y.* vi, p. 152.—Tate, *Ann. and Mag. N. H.* 1869, p. 356.—*Dentellaria orbiculata* W. G. Binn. *Ann.* N. Y. Acad. Sci. iii, p. 110, t. 16, f. W, and t. 9, f. A (jaw and dentition.)

The largest species of Dentellaria. The principal variation is in the degree of elevation of the spire. The bands are sometimes lacking; and I have seen specimens with four narrow bands all near the periphery. The periphery is often subangular; the base is rather flattened, and slightly concave around the axis. Two specimens before me measure alt. 16, diam. 33 mill; alt. 20, diam. 33 mill.

H. badia Férussac. Pl. 29, figs. 25–27, 29, 30.

Imperforate, depressed, solid, opaque, somewhat shining, uniform dark chestnut colored, delicately striate, under a lens densely gran-

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ulate except on the inner whorls; spire low, dome-shaped, apical whorl flat, sutures linear, becoming impressed at the last whorl; whorls 5, slightly convex, slowly widening, the last depressed, subcarinate at the periphery, abruptly and deeply deflexed anteriorly, strongly constricted behind the peristome; aperture subhorizontal, oblong, transverse, upper and lower margins parallel; peristome dark purplish brown, right and basal margins expanded, basal margin subhorizontal, reflexed and adnate to the whorl at the umbilical tract, bearing within a strong compressed, slightly entering tooth at junction of basal and outer lips, and a low, wider tooth near the columella; terminations not converging, but joined by a thick callus. Alt. 10, diam. 17 mill.

Martinique; Guadeloupe; St. Lucia; Cayenne.

H. badia Fer. *Prodr.* 124; *Hist.* t. 56, f. 1–4.—Pfr., *Conchyl. Cab.* p. 355, t. 63. f. 7–10; *Monogr.* i, p. 309.—Guppy, *Ann. Mag. N. H.* 1869, p. 431.—*Dentellaria badia* W. G. Binn. *Ann. N. Y. Acad. Sci.* iii, 1884, p. 111, t. 16, f. Q; t. 9, f. G. (jaw and dentition.)

Pfeiffer notes a small form from Martinique which is acutely carinated, narrowly but openly umbilicate. There is considerable variation in color; some specimens are light yellowish, the peristome white or dark. Numerous light-brown specimens, with or without two dark bands, and with light or dark peristome are before me from Martinique. The body-whorl is much more depressed in this shell than in H. pachygastra, and the surface is microscopically granulated.

Var. guadeloupensis Pilsbry. Pl. 29, fig. 28.

Shell depressed, carinated at the periphery, of a medium shade of chestnut brown, with a lighter peripheral line; surface granulated as in H. badia; peristome broadly expanded, pure white; teeth of the basal margin large, nearer together than in H. badia, the right margin bearing a small tubercular denticle in adult examples.

Alt. 7, diam. 12 mill.

The tubercle of the right margin is concealed by the curve of the lip in the figure of this form.

H. lychnuchus Müller. Pl. 28, figs. 5–9.

Imperforate, depressed trochoidal, acutely carinated, solid, opaque, nearly lusterless, dark chestnut colored, obliquely striate, densely, finely granulate, the granules barely visible to the unassisted eye. Spire conical, very obtuse; apical whorl flat; sutures linear; whorls

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5, subplanulate, slowly widening, the last acutely carinated at the periphery, constricted and deflexed behind the peristome; aperture subhorizontal, transverse, silvery white within; peristome brown, expanded, convex, thickened, terminations remote, joined by a heavy ridge of callus, lower margin bearing two teeth, the inner small, compressed-tubercular, the outer large, compressed, its position marked behind the peristome by a deep pit or scrobiculation.

Alt. 17, diam. 32 mill.; alt. 14, diam. 26 mill.

Martinique; Guadeloupe.

H. lychnuchus MULL. *Hist. Verm.* ii, p. 81. (1773.)—FER. *Hist.* t. 56A, f. 2–8.—PFR. *Conchyl. Cab.* p. 346, t. 62, f. 13, 14.—REEVE, f. 248.—*Dentellaria lychnuchus* Müll. W. G. BINNEY, *Ann. N. Y. Acad. Sci.* iii, p. 112, t. 16, f. U, and t. 9 f. K. (jaw and dentition).—*Zonites lychnuchus* SAINT-SIMON *Journ. de Conchyl.* 1853, p. 234. (Anatomy.)

The largest of the carinate species of Dentellaria. It is most nearly allied to H. josephinæ, but is larger, more elevated, plainer in color. It is usually uniform dark brown, but sometimes lighter, with obscure spiral bands. The granulation is decidedly more minute than in H. perplexa.

H. JOSEPHINÆ Férussac. Pl. 29, figs. 31–33.

Imperforate, depressed, acutely carinated, solid, opaque; scarcely shining, light greenish yellow, banded with chestnut around the umbilicus and in the middle of the base, and with subsutural and supra-peripheral brown bands interrupted by radiating yellow flammules; surface covered with a dense microscopic corrugation, delicately obliquely striate. Spire low, rounded, obtuse; apex planulate; sutures linear; whorls 4½, subplanulate, slowly widening, the last carinated at the periphery, deeply deflexed at the aperture; aperture transverse, subhorizontal; peristome white, expanded, reflexed and adnate over the umbilicus, terminations remote, joined by a white parietal callus; basal margin with two teeth, the inner small, outer large, compressed, its position marked behind the peristome by a large and deep pit.

Alt. 11, diam. 23 mill.; alt. 8, diam. 17 mill.

Guadeloupe; Nevis; St. Kitt's; Dominica.

H. josephinæ FER. Hist. t. 56, f. 9, 10.—PFR. in *Conchyl. Cab.* p. 351, t. 62, f. 11, 12; *Monogr.* i, p. 310.—GUPPY, *Ann. Mag. N. H.* 4th, Ser. i.—REEVE, f. 272.—*Dentellaria josephinæ* Fér. W. G.

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BINNEY Ann. N. Y. Acad. Sci. iii 1884, p. 111, t. 16, f. s, and t. 9, f. D. (Jaw and dentition.)—(*Caracolla scabrella* MKE. Cat. Malsb. p. 5, teste Pfr.)

Distinguished from other carinated Dentellaria by the two maculose or interrupted bands of the upper surface.

The specimens from St. Christopher (St. Kitt's) are large, flattened; I have seen no specimens but fossil ones from this island.

Alt. 11, diam. 25 mill.

Var. NEVISENSIS Pilsbry. Pl. 25, figs. 54, 55.

A small form collected by OBER on the little island of Nevis. The whorl is less deflexed at the aperture than in typical H. josephinæ; the granulation of the surface is nearly effaced; bands of the base two or one, very faint or obsolete; upper surface with a single continuous band above the carina. Alt. 9, diam. 17–18 mill.

H. PERPLEXA. Férussac. Pl. 56, figs. 15–17.

Imperforate, depressed, acutely carinated, solid, opaque, lusterless, pale brown, unicolored, or with a chestnut band above and one beneath; surface coarsely granulose, granules whitish; spire more or less elevated, conical, obtuse; apex planulate; sutures linear; whorls 4½ to 5, the inner two convex, smooth, shining, the remainder nearly flat, penultimate nearly as wide as the outer whorl; body-whorl acutely carinated at the periphery, deeply deflexed anteriorly; aperture oblong, obliquely truncated by the parietal wall, subhorizontal; peristome broadly expanded, white, terminations joined by a white parietal deposit, lower margin bearing two rather strong teeth, the outer compressed, its position marked behind the peristome by a slight depression; inner tooth generally smaller, often with a minute denticle on each side of it.

Alt. 15, diam. 26 mill.; alt. 12, diam. 27 mill.; alt. 13, diam. 22 mill.

Grenada and Grenadines Is.

H. perplexa FER. *Hist.* t. 56 A, f. 1.—PFR. *Monogr.* iii, p. 216.—REEVE, f. 1210.—BLAND, *Am. Journ. Conch.* iv, p. 188.—*H. granifera* GRAY, *P. Z. S.* 1834, p. 68.—PFR. *Conchyl. Cab.* p. 347, t. 62, f. 16, 17 and *Monogr.* i, p. 304.—REEVE. f. 252.—*Dentellaria perplexa* Fér. W. G. BINN. *Ann. N. Y. Acad. Sci.* iii, 1884, p. 112, t. 16, f. T and t. 9, f. J. (Jaw and dentition.)

Varies considerably in elevation of the spire and in size. The granules are sometimes nearly effaced above. The coarser granula-

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tion and scarcely obvious scrobiculation behind the peristome will separate this species from H. josephinæ and lychnuchus. It is more nearly related to H. formosa than to any of the other species.

H. FORMOSA Férussac. Pl. 29, figs. 34–36.

Imperforate, depressed-globose, solid, opaque, slightly shining, straw-colored, with two broad dark chestnut bands, covered with a coarse network of silvery maculations and streaks; surface rather coarsely granulose, the granulation generally subobsolete except on the base; spire low, rounded, apex flat; sutures linear; whorls 4½, nearly flat, slowly widening, the last depressed-subglobose, rounded at the periphery, very deeply descending anteriorly; aperture oblong-oval, nearly horizontal; peristome broadly expanded, continuous, white or orange-brown; basal margin horizontal, widened by a plate-like callus within, which is abruptly truncated at the union of basal and outer lips, the truncation marked behind the peristome by a very slight depression. Terminations of the peristome united across the parietal wall by an elevated callus.

Alt. 14, diam. 24 mill.; alt. 10, diam. 18 mill.

Antigua; Barbuda.

H. formosa FER. *Prodr.* 67.—PFR. *Conchyl. Cab.* p. 111, t. 15, f. 14–16; *Symb.* ii, p. 28; *Monogr.* i, p. 308.—*H. lenocinia* FER. *Hist.* t. 47, f. 1.—*Dentellaria formosa* BECK, *Index*, p. 34.—W. G. BINNEY, *Ann. N. Y. Acad. Sci.* iii, 1884, p. 111, t. 16, f. R, and t. 9, f. H. (Jaw and dentition.)

The horizontal, oval aperture, continuous peristome and peculiar painting of this form are very characteristic. The shells from Barbuda are small, body-whorl carinated. The species is allied to H. perplexa.

H. PACHYGASTRA Gray. Pl. 28, figs. 18–20.

Imperforate or subperforate, globose-depressed, solid, opaque, shining, chestnut colored, with delicate lines of increment; not granulated; spire very low, convex; apical whorl flat; sutures linear, a little impressed on the last half of the outer whorl; whorls 4, a trifle convex, penultimate about as wide as the last; body-whorl depressed, rounded, but with a carina around the periphery, scarcely at all deflexed anteriorly; aperture oblique, transverse, subrhomboidal; peristome flesh-colored or brown, slightly expanded, thickened, convex, its right extremity obtusely angled at the position of the periphery; lower margin bearing on its outer part a large, com-

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pressed, entering tooth, marked outside by a corresponding furrow or groove, and a smaller compressed tooth nearer the insertion. Baso-columellar lip reflexed over the umbilicus, nearly or wholly covering it; ends of peristome remote, joined by a parietal ridge of callus. Alt. 12, diam. 20 mill.; alt. 10, diam. 16 mill.

Martinique; Guadeloupe.

H. pachygastra GRAY, *P. Z. S.* 1834, p. 68.—PFR. in *Conchyl. Cab.* p. 77, t. 10, f. 3, 4; *Monogr.* i, p. 309.—REEVE f. 270.—*H. fuliginea* var. *fuscoviridis* GRAT. *Actes Soc. Linn. Bord.* xi, p. 403, t. 1, f, 15.—*H. dolata* Fér. PFR. *Symb.* i, p. 37, and of DESH.—*Dentellaria pachygastra* Fér. BINNEY, *Ann. Lyc. N. H. of N. Y.* iii, 1884, p. 111, t. 16, f. P and t. 9, f. F (Jaw and dentition.)

By the often partly open umbilicus and the shape of the aperture, this species leads toward H. auridens.

The globose body-whorl and smooth surface separate H. pachygastra from the preceding forms. It is allied to H. nigrescens Wood, but lacks the strong parietal tooth of that form. The groove or scrobiculation marking the place of the outer basal tooth is not sufficiently indicated in figure 20.

H. NIGRESCENS Wood. Pl. 55, figs. 12–14.

Imperforate, globose, solid, opaque, deep brown, shining, regularly, densely, finely striate; not granulated; spire dome-shaped, obtuse; sutures linear, the last impressed; whorls 4, slightly convex, slowly widening, the last ventricose, with a carina sketched around the periphery, slightly descending anteriorly; aperture slightly oblique, transverse, trilobed; peristome deep brown, thickened, expanded, bearing inside a compressed tooth at the place of junction of outer and basal margins, which is marked behind the peristome by a slight scrobiculation or groove, and another tooth on the middle of the basal margin; terminations of peristome remote, joined by a heavy dark callus; *parietal wall bearing a prominent compressed entering tooth.* Alt. 11, diam, 17 mill.

Dominica; Guadeloupe.

H. nigrescens WOOD, *Index Test.* Suppl. t. 7, f. 32.—PFR. in *Conchyl. Cab.* p. 78, t. 10, f. 15, 16; *Monogr.* i, p. 309.—REEVE, f. 280.—GUPPY *Ann. Mag. N. H.* 4th Ser. i, p. 431.—*H. fuliginea* Fér. in PFR. *Symbolæ*, i, p. 37.—*Dentellaria globularis* Schumacher, *teste* BECK, *Index*, p. 35.

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(Subsection *Gonostomopsis* Pilsbry, 1889.)

Chrysodon Ancey, Conchologists' Exchange i, p. 54, April, 1887 (not *Chrysodon* Oken, 1815).

H. auridens Rang. Pl. 49, figs. 71–73.

Umbilicate, depressed, rather thin, slightly shining, dark chestnut brown all over, with a few irregularly-scattered golden dots; surface very delicately striatulate, and sparcely hirsute, the hairs very short, arranged in quincunx, and about ½ millimetre apart, spire depressed, nearly planorboid; apex not rising above the succeeding whorl; sutures well impressed from the beginning; whorls 4 to 4½, convex, the inner moderately, the last rapidly widening; body-whorl depressed, rounded, a little descending anteriorly, indented around the umbilicus; aperture oblique, irregularly lunate, brown within; peristome narrowly expanded, brown, its terminations distant; outer margin straightened, bearing an acute tooth in the middle, its position marked by a pit or scrobiculation outside the peristome; basal margin with a small tooth in the middle. Umbilicus rather narrow, deep. Alt. 6½–8, diam. 13–15 mill.

Martinique.

H. auridens Rang, Guérin's Mag. de Zool. 1834, t. 49.—Fer., Hist. t. 69 K, f. 8–12.—Pfr. Monogr. i, p. 412; Conchyl. Cab. p. 361, t. 64, f. 1–3.—Reeve, f. 281.

Separated from other species of Dentellaria by the open umbilicus and peculiar aperture. The form of the aperture and whole aspect of the shell forcibly recalls H. obvoluta Müll. of Central Europe, and other similar species of the section *Gonostoma*.

Section V. Cepolis Montfort, 1810.

Cepolis Montf. Conch. Syst. ii, p. 150.—Albers-Martens, Die Heliceen, p. 152 (1860).—Pfeiffer-Clessin, Noment. Hel. Viv. p. 175.—*Cepolum* Montf. Conch. Syst. ii, p. 151.

The animal of Cepolis has not been observed. The principal peculiarity of the shell is the deep scrobiculation of the base a short distance behind the aperture, corresponding with a strong fold-like tooth inside. I have united with this section the divisions called *Averellia* and *Angrandiella* by Mr. Ancey, and have separated from it a number of Asiatic forms which Pfeiffer places here.

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Key to the species of Cepolis.

Broadly umbilicated; depressed,
  Spire slightly convex; aperture 1-toothed, *angrandi.*
  Spire concave; aperture 2-plicate within, *macneili.*
Imperforate or narrowly perforate,
  Aperture 2-toothed within,
    Peristome broadly expanded, flattened; spire conoidal, *pimesoma.*
    Perist. less expanded, not flattened; spire depressed,
      Periphery obtusely angular, *cepa.*
      Periphery rounded, *trizonalis.*
  Aperture not 2-toothed; surface rough. *squamosa.*

H. CEPA Müller. Pl. 49, figs. 55–58, 62–64.

Covered-perforate, or imperforate, globose-depressed, solid, opaque, somewhat shining, chestnut brown, with a spiral light band on the upper surface, lighter colored beneath; surface obliquely striate and finely rugose all over; spire depressed, low; apex slightly obtuse; suture slightly impressed from the beginning outward; whorls 4½ to 5, the inner moderately, the last rapidly widening, and then becoming narrower on its last one-fourth, then expanded at the aperture; periphery subcarinated; base convex; body-whorl deeply, abruptly deflexed anteriorly, and with a deep furrow or pit a short distance behind the aperture at the periphery; aperture quite oblique, brown within, rounded-lunar; peristome narrowly expanded, baso-columellar margin reflexed and adnate over the umbilicus, nearly or wholly covering it, bearing within a strong square tubercle; outer wall of aperture bearing a short distance within a strong callous fold. Terminations of peristome not converging, joined by a light callus.

Alt. 20–25, diam. 37–45 mill.

Hayti.

H. cepa MULL. Hist. Verm. ii, p. 94.—FER., Hist. t. 53 A, f. 1, 2.—PFR. in Conchyl. Cab. t. 10, f. 9, 10; Monogr. i, p. 303.—*H. impressa* BLAINV., Dict. sc. nat. xx, p. 427.—*Cepolum nicolsinianum* MONTF. Conch. Syst. ii, p. 151.

A small form before me measures, alt. 17, diam. 31 mill.

H. TRIZONALIS Grateloup. Pl. 49, figs. 68–70.

Imperforate or narrowly perforate, depressed-globose, strong, shining, yellowish-white with three brown zones, base whitish; sur-

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face very regularly, densely striate, the striation noticeably coarser just behind the peristome; spire low, convex; apex polished, obtuse; sutures impressed; whorls 4 to 4½, convex, the last wider, rounded at the periphery, deeply deflexed anteriorly, and with a deep groove or pit on the periphery a short distance behind the peristome; aperture quite oblique, rounded-lunate, white and showing the bands within; peristome broadly expanded, white, terminations somewhat converging, lower margin reflexed, partly or wholly closing the umbilicus, bearing within a tubercular tooth; outer wall bearing a callous fold a short distance within. Alt. 12–13, diam. 23 mill.

Hayti.

H. trizonalis GRAT. Act. Soc. Linn. Bord. xi, p. 401, t. 1, f. 8.—PFR. Monogr. i, p. 345; Conchyl. Cab. 474, t. 158, f. 12–15.—REEVE, f. 592.

Not an uncommon species. Pfeiffer mentions a pure white variety.

Var. TRIZONELLA Pilsbry. Pl. 49, figs. 65–67.

Umbilicate; smaller than the type; very regularly obliquely costulate, the costulæ obsolescent around the umbilicus; aperture small, rounded, the terminations of the narrowly-expanded peristome joined by a white heavy parietal callus. Teeth as in H. trizonalis.

Alt. 10, diam. 16 mill.

H. TRIZONALOIDES A. D. Brown.

Imperforate, globose, thick, obliquely striated (pale horn color?), encircled by three brown bands; spire elevated; whorls 5, rather convex, the last furrowed behind the lip, forming a tubercle within; aperture very oblique, ovate, with two teeth, one on the basal margin, the other within the aperture; peristome white, widely reflected, covering the umbilicus.

Alt. 21, diam. maj. 21, min. 17 mill. (*Brown.*)

Hayti?

Allied to H. trizonalis Grat., and also in the peculiar arrangement of the teeth to H. cepa Müll. From the former it differs in having the umbilicus entirely closed; in the internal tubercle which is stouter than in trizonalis; in the more elevated spire; and in being heavier and more coarsely striated. From cepa it is readily distinguished by its more elevated spire, smaller size and more oblique aperture. I am in doubt as to the locality of this shell, but

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from the singular arrangement of the teeth resembling both trizonalis and cepa, I am disposed to refer it to Hayti. (*Brown.*)

H. trizonaloides BROWN, Proc. Acad. Nat. Sci. Phila. 1861, p. 333.—PFR. Monographia v, p. 312.

Known to me only by the above description and remarks.

H. PIMESOMA Pilsbry. Pl. 24, figs. 44–47.

Imperforate, depressed-globose-conic, solid, yellowish with two brown bands on the upper surface, obliquely striate; spire low-conical, apex glossy, obtuse; suture impressed; whorls 4½, convex, the last depressed, rounded at periphery, deeply, abruptly deflexed anteriorly, and with a deep pit on the periphery a short distance behind the aperture; aperture small, quite oblique, nearly closed by the teeth projecting into it; peristome very broadly reflected, flattened, its lower margin straightened, adnate over the umbilicus, bearing a square tooth within; outer wall of aperture bearing a heavy callous tooth a short distance within. Terminations of peristome only slightly approaching.

Alt. 12, diam. maj. 19, min. 15½ mill.

Hayti.

This species is distinguished from H. trizonalis by its smaller aperture, more obstructed by large teeth; more conical spire; and much more broadly reflected, flattened peristome. There is no indentation at the place of the umbilicus.

H. SQUAMOSA Férussac. Pl. 56, figs. 20–22.

Imperforate, depressed, carinated, thin but rather strong, lusterless, brownish yellow, irregularly and rather sparsely speckled with small chestnut-brown elongated spots; surface decussated by rather coarse spiral grooves and oblique sulci; spire low, apex polished, suture impressed; whorls 4½, slightly convex, the last carinated at the periphery, the carina crenulated by the prominent oblique riblets of increment, base flattened, indented around the axis; in front the whorl descends abruptly; it is a trifle constricted just behind the peristome, then gibbous, and behind this gibbosity there is a decided indentation just above and upon the periphery; aperture quite oblique, broad lunar; peristome flesh colored, narrowly expanded, the baso-columellar margin adnate to the whorl over the umbilicus and for a distance on the base; thickened within.

Alt. 9, diam. 17 mill.

Ins. Porto Rico.

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H. squamosa Fer., Hist. t. 41. f. 3.—Pfr. Monogr. i, p. 294; iii, p. 207; Conchyl. Cab. p. 45, t. 72, f. 12–14.—Reeve, f. 1300.—*H. macularia* Lam. An. s. Vert. p. 89.—Chenu, Ill. Conchyl., Helix, t. 6, f. 15.

(Subsection *Averellia* Ancey.)

Coelospira Ancey, Conchologists' Exchange, i, p. 20, Nov., 1886, (not of Hall)—*Averellia* Ancey, Conchol. Exch. i, p. 54, April, 1887.

H. macneili Crosse. Pl. 49, figs. 59–61.

Broadly umbilicate, depressed, planorboid, rather thin, lusterless, corneous brown, with three obscure brown spiral bands, base lighter; surface nearly free from growth-lines, under a lens seen to be thickly beset with numerous very short hairs; spire immersed, concave, apex whitish; sutures impressed; whorls 4 to 4½, convex, the inner slowly, the penultimate rapidly widening, last whorl wide, convex above and beneath, rounded at the periphery, very deeply descending toward the aperture, and with a deep long groove or scrobiculation above its middle, and a short one on the base, behind the peristome; aperture brown inside, subhorizontal, oblong-lunar, bisinuate inside; peristome narrowly expanded all around, white, the terminations distant but converging, connected by a very thin parietal callus; lower margin bearing within an acute entering short fold; upper margin bearing an acute long entering lamella. Umbilicus broad, perspective, showing the whorls to the bottom.

Alt. 5½, diam. 13–14 mill.

Chiriqua Lagoon, Nicaragua; Coast Region and lower hills, from Parismina to the Hills of Zhorguin, Costa Rica.

H. mac-neili Crosse, Journ. de Conchyl. 1873, p. 67; l. c. 1874, p. 71, t. 2, f. 3.—Pfr., Monographia vii, p. 451.—Angas, *P. Z. S.* 1879, p. 476.

(Subsection *Angrandiella* Ancey.)

Angrandiella Anc. Conchologists' Exchange, i, p. 20, Nov., 1886.

H. angrandi Morelet. Pl. 25, figs. 48–50.

Umbilicate, orbicular-convex, thin, shining, striatulate, beneath decussate-malleate; corneus-rufous, with a narrow peripheral zone; spire slightly elevated; suture narrowly marginate; umbilicus of medium width, perspective; whorls 5, slightly convex, slowly widening, the last a little dilated, rather turgid beneath, broadly scrobic-

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ulate behind the aperture, descending anteriorly; aperture very oblique, oval, with a dentiform fold inside the columellar margin; peristome white, margins joined by a callus, the upper expanded, columellar margin dilated, reflexed.

Alt. 8, diam. maj. 25, min. 22 mill. (*Morelet.*)

Chocquequiras on the Apurimac river, Peru.

H. angrandi MOREL. Series Conchyl. iii, p. 168, t. 7, f. 3. (1863) —PFR., Monographia v, p. 504.

Section VI. LUCERNA Swainson, 1840.

Lucerna SWAINS. Treatise on Malacol. p. 329.—*Lucerna* "Humph" H. AND A. AD. Genera, ii, p. 198.—(? *Caprinus* MONTF. Conch. Syst. ii, p. 142.)—*Pleurodonta* BECK, MORCH, ALBERS, ALBERS-MARTENS, PFEIFFER, and others, not of FISCHER DE WALDHEIM.—*Lyrostoma* MORCH, Cat. Yoldi, p. 11, not of SWAINSON.

The name *Pleurodonta* was proposed for H. lychnuchus, a form now classed in Dentellaria; and if used at all, should replace the latter name. *Caprinus* of Montf. may have been founded on H. lucerna or a small form of H. acuta; but the figure and description are sufficiently vague to render any identification doubtful.

There is a surprising amount of variation in the species of this group. Specific distinctions seem to be indeed wholly artificial; and the variations in some cases connect the most dissimilar forms into continuous series. Professor C. B. ADAMS, of Amherst, seems to have first seen the significance of these variations, and their bearing on the question of the mutability of species. (See Contributions to Conchology No. 10, p. 189, and in other places in the same publication.) This was eight years before the publication of "The Origin of Species."

Of course the "Key" to species given below will not always enable one to name intermediate or transition forms.

Key to species of Lucerna.

A. SPECIES WITH NOT MORE THAN TWO TEETH ON THE PERISTOME.

Lip expanded all around.

Granulate above, polished beneath; no teeth, *carmelita.*

Granulate all over; one or two small teeth on basal lip, *bainbridgei.*

Outer whorl scarcely or not at all granulate, *spengleriana.*

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Lip scarcely expanded above.

Teeth of basal lip two; extending more than half-way to parietal wall, *lucerna.*

Teeth of basal lip not extending half-way to parietal wall,

Edge of whorls undulating, *chemnitziana.*

Edge of whorls smooth,

Basal lip adnate for a considerable distance to the base, *subacuta.*

Basal lip adnate only near and over umbilicus, *acuta.*

B. SPECIES WITH THREE OR FOUR TEETH ON THE BASAL LIP OF PERISTOME.

Body-whorl flattened, depressed, acutely carinated,

Shell unicolored, brown,

Carina very acute; size large, *peracutissima.*

Carina less acute; diam. under 36 mill. *cara.*

Shell conspicuously banded,

Center of base dark, *soror.*

Base with a dark girdle, center light,

Acutely carinated, lip 4-toothed, *schroeckeriana.*

Obtusely carinated, lip 3-toothed, *tridentina.*

Body-whorl globose-depressed; obtusely carinated or rounded; with a short furrow or groove above the peripheral carina, and parallel with it, a short distance behind the peristome.

Body-whorl decidedly depressed; umbilicus open; 4 teeth equally spaced.

Parietal wall elevated; peristome solute, *anomala.*

Parietal wall adnate, *sinuosa.*

Body-whorl globose-depressed; imperforate or umbilicus narrow,

Outer tooth abruptly bent outward at its inner end, *sinuata.*

Outer tooth parallel with the adjacent tooth,

Diam. 24 mill. or more, *simson.*

Diam. 23 mill. or less, *invalida.*

Body-whorl globose-depressed, obtusely carinated or rounded, without any furrow or groove above the periphery behind the aperture.

Outer two teeth of base contiguous, decidedly united at the base,

3 furrows behind peristome,

Fourth (outer) tooth the smallest, *okeniana.*

Outer tooth not smallest, *sloaneana, bronni, valida.*

Outer two teeth scarcely or not at all united at base,

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Umbilicate; peristome continuous, parietal margin elevated, *pallescens.*

Narrowly or not umbilicate; parietal margin adnate,

Color light, spirally brown-banded, *atavus.*

Dark, with zigzag silvery stripes, *picturata.*

H. CARMELITA Ferussac. Pl. 34, figs. 1–3.

Imperforate, depressed, slightly dilated transversely, solid, opaque, shining, chestnut-brown or nearly black, surface marked above the periphery by oblique incremental striæ composed of elongated granules, beneath the periphery surface smooth, shining; under a lens there becomes visible an excessively minute sculpture of short scratches, irregularly cross-hatching the surface between the granules; the granulation and microscopic sculpture sometimes subobsolete. Spire low, rounded, obtuse; apex flat; suture linear, becoming impressed at the latter half of the last whorl. Whorls 4, nearly planulate, gradually widening, the last wider, angular at the periphery, becoming rounded on its latter third, briefly deflexed anteriorly, not indented in the center beneath. Aperture oblique, oblong-truncate, silvery or bluish-white within; peristome expanded all around, white, baso-columellar margin reflexed and adherent to the base, and expanded over the umbilicus in a wide white callus. Margins of the peristome remote, joined by a translucent parietal deposit. Alt. 21, diam. 44 mill.

Jamaica.

H. carmelita FER. *Prodr.* 85; *Hist.* t. 32, f. 4.—PFR. *Symb.* iii, p. 73; *Monogr.* i, p. 295; *Conchyl. Cab.* p. 362, t. 138, f. 4–6.—REEVE, f, 181.—*H. mora* GRAY *Griff. Anim. Kingd.* t. 36, f. 1.—*H. redfieldiana* C. B. AD. *Contr. to Conch.* No. 7, p. 107.

Differs from the following species in the more depressed form, more expanded umbilical callus, less expanded peristome and different sculpture; there is frequently an obtuse low tubercle on the columella, close to the insertion. The basal lip is never toothed, as it is in the following forms.

H. BAINBRIDGEI Pfeiffer. Pl. 33, figs. 1, 2, 7, 8.

Imperforate or with a narrow umbilical fissure, depressed, solid, opaque, rather dull, brown, more or less tinged with purplish or greenish, lighter around the axis below, and with a light peripheral fascia; surface evenly granulate above and below; spire low-conoidal,

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apex obtuse, plane; sutures linear. Whorls 5, plane, slowly widening, the last not descending, bluntly subangular in front of the aperture. Aperture very oblique, livid-brown inside, showing the light band; peristome broadly expanded and recurved in every part, polished, brown; basal margin bearing a small compressed pliciform denticle at the point of its junction with the outer lip, and often a small tubercle nearer the columella; columellar margin short, arcuate, broadly expanded and adnate over or nearly over the umbilical tract. Margins of peristome joined by a polished brown callus.

Alt. 28–33, diam. 54–61 mill.

Jamaica.

H. bainbridgei Pfr. *P. Z. S.* 1845. p. 44; *Conchyl. Cab.* p. 357, t. 63, f. 5, 6; *Monogr.* i, p. 313.—Reeve, f. 222.—*H. lamarckii var. unidentata* Fer. *Hist.*, t. 58, f. 1, 2. ?—*H. pretiosa* Ad. *Contr. to Conch.* no. 9, p. 171; no. 10, p. 204.—Pfr. *Monogr.* iv, p. 240.—*H. spengleriana* Pfr. *P. Z. S.* 1846, p. 111; *Monogr.* i, p. 292; *Conchyl. Cab.* p. 311, t. 128, f. 1, 2.

Differs from H. carmelita in being more finely granular, and equally so above and beneath. There is no mistake about the identity of the forms included in the above synonymy. In the large series before me transition forms are more numerous than typical examples of the several varieties.

Var. pretiosa C. B. Ad. Pl. 33, figs. 6, 7, 8.

Typically this form has a higher spire than H. bainbridgei, and the substance of the shell is white; the thin cuticle is yellowish; peristome white. Alt. 35, diam. 55 mill.

Var. spengleriana Pfr. Pl. 34, fig. 4; pl. 30, fig. 53.

Similar in form to typical H. bainbridgei; upper whorls very minutely granulated; *body-whorl striate, smooth, not granulated.* Differs from bainbridgei in the lack of granulation on the last whorl.

H. subacuta Pfeiffer. Pl. 25, figs. 56, 57.

Imperforate, depressed-convex, carinate, solid, opaque, shining below, duller above, brown; surface above somewhat granulated upon the oblique incremental striæ, nearly or quite smooth beneath; spire low, obtuse; apex planulate, suture linear; whorls 5, a trifle convex, slowly widening, the last carinate, depressed; aperture wide-lunar, transverse, very oblique, livid within; peristome white, upper

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margin simple, obtuse, outer slightly expanded, basal margin reflexed and adnate for a considerable distance to the base; bearing within two small, somewhat-compressed teeth.

Alt. 25, diam. 45 mill.

Jamaica.

H. subacuta PFR. Malak. Bl. 1867, p. 127; Monographia v, p. 318.

This is rather a rare species, heretofore unfigured. It is similar to H. carmelita in being granular above, smoother and polished beneath, but differs from that form in having teeth on the basal lip. From H. bainbridgei, lucerna, acuta, chemnitziana, spengleriana, etc., it is separated by the close adhesion and appression of the basal lip to the body-whorl nearly as far as the outer tooth of the basal margin.

H. ACUTA Lamarck.

Under the above name I include a number of forms of Jamaica Helices which authors have attempted to establish as distinct species. I unite these forms only after the closest study of hundreds of specimens, and because absolute inosculation of the several supposed specific types is exemplified by numerous specimens before me. The descriptions below apply to *typical examples* of the varieties; but as I have just said, intermediate forms connecting these in every direction may be expected by the student.

H. ACUTA var. ACUTA Lam. Pl. 26, fig. 61.

Imperforate, depressed, very acutely carinated, solid, opaque, nearly lusterless, yellowish-brown or chestnut, finely granulate all over; spire more or less depressed, very low-conical, obtuse; apex planulate; suture linear; whorls 5 to 5½, flat, slowly widening; body-whorl acutely carinated at the periphery, concave above, convex below the carina; base convex, constricted behind the peristome; aperture transverse, white or pinkish within; peristome white or brown, slightly expanded and obtuse above, broadly expanded below, thickened, bearing inside two rather strong, acute teeth, the outer one usually marked behind the peristome by a slight depression. Alt. 25, diam. 50 mill.

Jamaica.

H. acuta LAM. in Encyc. Méth. t. 462, f. 1.—*Caracolla acutissima* LAM. An. s. Vert. vi, pt. 2, p. 95.—*H. lamarckii* var. DESH. in Fér Hist., t. 57, f. 2, 3.—*H. acutissima* DESH., Encyc. Méth. ii, p. 261,

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and of most authors.—*H. heteroclites* LAM. An. s. Vert. p. 74.—*H. acuta* var. *β*. PFR. Monogr. i, p. 313.

This form is really the typical H. acuta of Lamarck, which is thus seen to be absolutely synonymous with H. acutissima of the same author. It is the *var. β.* of Pfeiffer. Pfeiffer has in the face of these facts, restricted *acuta* to the smaller, bluntly-carinated variety, and given to the shell figured in the Encyclopedie the varietal name *acutissima* or var. *β*. I question the propriety of restricting typical *acuta* to a form Lamarck probably never saw and certainly did not figure or describe. If we use the name *acutissima* at all, it must replace *acuta in toto.*

Var. LAMARCKII Fer. Pl. 26, figs. 58, 65.

Generally smaller than the type; periphery rounded or bluntly angled; teeth of the basal lip two, generally strong, rather near together, compressed, acute, spire more or less elevated.

Alt. 18, diam. 35; alt. 33, diam. 63 mill.

H. acuta PFR., in Conchyl. Cab. p. 357, t. 63, f. 13, 14; *H. acuta g* and *d* PFR., Monographia.—*H. lamarckii* FER. Prodr. 129, Hist. t. 57, f. 1.

Var. SUBLUCERNA Pilsbry. Pl. 30, fig. 52.

This is a form about the size and shape of H. lucerna, whitish below, light brown above, lip edged with brown; basal teeth two, small, acute; periphery angular or rounded; sometimes perforate.

Alt. 16–17, diam. 33 mill.

This form was figured by Pfeiffer (Conchylien Cabinet, Helix, t. 62, f. 15) as a form of H. lucerna. After examining numerous specimens I am satisfied that it belongs to H. acuta. It is not nearly so deeply scrobiculate behind the peristome as H. lucerna.

Var. PATINA C. B. Ad. Pl. 26, figs. 66; pl. 33, figs. 3–5.

Conical or depressed; always carinated; lip white or flesh-colored, basal margin bearing a *single tooth*, rather small, *tubercular, not compressed;* surface granulate all over; base generally lighter colored than upper surface. Alt. 20–25, diam. 51–55 mill.

H. patina C. B. AD. Contr. to Conch. no. 2, p. 29.—REEVE, Conch. Icon. f. 218.—PFR. Monogr. iii, p. 215; Conch. Cab. p. 300, t. 126, f. 3, 4.

There is a less-depressed form named by A. D. Brown (in coll.) H. goniasmos. Mr. Brown's type is represented on pl. 26, fig. 60.

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H. nannodonta A. D. Brown mss. is a form similar to goniasmos, but with a second tooth developed near the columella. Both teeth are tubercular. The type is figured on pl. 26, fig. 62. Férussac's figures of *H. lamarckii var. unidentata* (Histoire, t. 58, f. 1, 2) are probably referable to H. patina, or to a form intermediate between patina and typical acuta. These figures are copied on my pl. 33, figs. 3, 4, 5.

I would retain H. patina separate from H. acuta, on account of the single basal tooth, which is tubercular, not compressed, were it not connected directly by intermediate examples with acuta. H. patina often has two basal teeth; both are small; they are rather separated.

Var. OXYTENES A. D. Brown (*mss*). Pl. 55, figs. 4, 5.

Still more depressed than H. patina; periphery compressed into a knife-like carina; base of the aperture with one or two small teeth; borders of the whorls a trifle undulating, but much less so than in H. chemnitziana. Alt. 20–23, diam. 53–58 mill.

Var. INGENS C. B. Ad. Pl. 27, fig. 80.

Much depressed, especially above; carina acute, compressed, concave above and below; teeth of the basal lip generally two, stouter and nearer together than in H. patina *and compressed*, acute, not tubercular. The inner tooth often has one or more small denticles near it as in H. chemnitziana. The borders of the whorls are often somewhat uneven above, but not distinctly undulating. The color varies from a yellowish-flesh tint to deep chestnut-brown; light specimens have dark inner whorls. The umbilicus is generally covered by expansion of the lip. Lip and aperture white, flesh-tinted or brown. Alt. 30, diam. 65 mill.; often greater or less.

H. ingens C. B. AD. Contr. to Conch. no. 5, p. 76; no. 9, p. 170.—REEVE, f. 221.—PFR. Monogr. iii, p. 214.

Var. NOBILIS C. B. Adams. Pl. 26, figs. 59, 63, 64.

Shell transversely ovate-orbicular, moderately and irregularly convex above, regularly and very convex beneath; above reddish or blackish brown, with paler spaces; beneath with a broad belt of blackish-brown next to the periphery, within which the shell is of a bright yellowish-green; lip purple, irregularly spotted with white; surface rather feebly granulated, smooth near the apex and umbilical region, the lower part of the whorls for the most part undulated by short oblique impressions; spire moderately elevated; whorls a little

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more than 5, subplanulate, with a slightly impressed suture; last whorl with an acute periphery, above which it is concave in its last half, and below which it is slightly concave in its first half; aperture subtriangular, with the lower outline much curved, with one moderately-developed tooth below near the right side; labrum well reflected, moderately thickened; umbilicus wanting. (*Adams.*)

Alt. 23, diam. 50 mill.

H. nobilis C. B. Ad. Contr. to Conch. no. 7, p. 106.—Pfr. Monogr. iii, p. 215; iv, p. 246; v, p. 319.

Undoubtedly another variety, allied to goniasmos. Adams' original description is given above. Figure 64 is drawn from a typical specimen. Figures 59, 63, represent mutations of the same variety. I am inclined to consider Pfeiffer's *H. abnormis* an abnormally elevated form of nobilis.

H. abnormis Pfeiffer. Pl. 34, fig. 7.

Imperforate, trochiform, solid, minutely granulated, scarcely shining, rufous, above white; spire conoidal, obtuse; whorls 5½, convex, slowly widening, the last scarcely descending anteriorly, nearly rounded at the periphery; base plane; aperture nearly horizontal, rotund-lunar; peristome subthickened, the margins parallel, joined by a thin callus; upper margin slightly expanded, basal margin with a conical tooth on its right side, somewhat dilated, reflexed and adnate in the region of the umbilicus.

Alt. 23, diam. 42 mill. (*Pfeiffer.*)

Jamaica.

H. abnormis Pfr., *P. Z. S.* 1854, p. 56; Monogr. iv, p. 240; v, p. 311.—Reeve, f. 1275.

I have above expressed the opinion that this form is a modification of H. nobilis Ad. That species is frequently rounded at the periphery, or only bluntly angular. H. abnormis is probably abnormal. I have seen no specimen just like it among the hundreds of Jamaica Helices I have examined.

H. chemnitziana Pfeiffer. Pl. 30, figs. 43–45.

Imperforate, depressed, acutely carinated, solid, opaque, brown, scarcely shining; surface minutely granulate all over; spire low, obtuse; apex flat; sutures linear; whorls 4½–5, flat, *their lower margins regularly undulated by short low folds of the upper surface;* body-whorl very convex below, generally with a dark spiral band on

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the lower surface; aperture large, trapezoidal, with a compressed acute tooth to the right, and an equal one, flanked by one or several denticles toward the columella; peristome flesh-colored, upper margin slightly expanded, lower margin reflexed, adnate over the umbilicus, and to the base for a longer or shorter distance.

Alt. 22–24, diam. 50–56 mill.

Jamaica.

H. chemnitziana Pfr. P. Z. S. 1845, p. 43; Conchyl. Cab. p. 299, t. 126, f. 1, 2; Monogr. i, p. 301.—Reeve, f. 220.—*H. fluctuata* C. B. Ad. Contrib. to Conch. no. 2, p. 29.

Separated from H. patina, H. acuta, etc., by the decidedly undulating lower part of each whorl. Large specimens are somewhat dilated transversely.

H. lucerna Müller. Pl. 30, figs. 46–49.

Imperforate, depressed, more or less bluntly carinated, solid, opaque, varying from yellowish to reddish-brown in color; surface granular all over, slightly shining, spire more or less depressed, obtuse; apex flattened; sutures linear; whorls 5, nearly planulate, slowly widening, the last more or less carinated; aperture transverse, peristome white or brown, upper margin scarcely expanded, basal margin reflexed, thickened, bearing two strong compressed subequal teeth inside, near together, their positions marked behind the peristome by large pits. Alt. 16, diam. 32; alt. 18, diam. 38 mill.

Jamaica.

H. lucerna Mull. Hist. Verm. ii, p. 13.—Fer. Hist. t. 56 B, f. 1–7.—Pfr Monogr. i, p. 315; Conchyl. Cab. p. 154, t. 20, f. 8, 9.—Reeve, f. 229.—*H. fuscolabris* Ad. Contrib. to Conch. no. 7, p. 120.—Pfr. Monogr. iii, p. 258; Conchyl. Cab. p. 466, t. 156, f. 24, 25.—*H. julia* Fer. Prodr. p. 35; Hist. t. 56 B, f. 1.—Pfr. Monogr. v, p. 315.

This species is more nearly allied to the small blunt-keeled, bidentate variety of H. acuta than to anything else. It may be separated from all forms of H. acuta by the flatter base, more compressed aperture, larger teeth, and especially the decidedly deeper, larger constriction or scrobiculation behind the peristome.

Var. julia Férussac. Pl. 34, figs. 5, 6.

Periphery rounded or very bluntly angled, encircled by a light band; spire elevated; parietal callus strong; basal teeth strong, compressed, near together. Alt. 19, diam. 33 mill. Often smaller.

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Var. FUSCOLABRIS C. B. Adams. Pl. 30, figs. 50, 51.

Umbilicate or imperforate; carina bordered beneath with dark, base paler toward the middle; aperture and peristome brown.

Alt. 16, diam. 36 mill.

H. RHYNCHÆNA A. D. Brown.

Imperforate, depressed-conical above, convex beneath, carinated, solid, subfulvous, obsoletely granulose; whorls 5, nearly flat, the last inflated, excavated above the carina; aperture very oblique, angular below, produced into a rostrum above, armed with a small tooth at the carina; peristome isabella-colored, broadly reflexed, margins joined by a thin callus, basal margin thickened.

Alt. 20, diam. maj. 52, min. 43 mill. (*A. D. B.*)

Jamaica.

H. rhynchæna BROWN, in Journ. de Conchyl. 1870, p. 392.

This is evidently a form allied to some of the varieties of H. acuta. Mr. Brown seems to have abandoned the name; for in his collection there are no specimens—not even the type—marked *rhynchæna.*

* * *

H. PERACUTISSIMA C. B. Adams. Pl. 27, figs. 70, 71

Perforate or covered, depressed, thin but strong, opaque, slightly shining, chestnut-brown, unicolored, obliquely irregularly striated, minutely granulated all over, the granulation sometimes nearly effaced; spire low-conoid or flattened; apex planulate; sutures linear or projecting instead of impressed; whorls 4½ to 5, slowly increasing, the last generally narrower toward the aperture, very acutely carinated, convex beneath, not descending anteriorly; aperture oblique, subtriangular; peristome expanded, brown, bearing inside the lower margin four teeth; a small one near the insertion, then a larger on the basal margin, then two near together, and situated upon a common eminence, toward the outer angle of aperture. The whorl is deeply tri-scrobiculate behind the peristome.

Alt. 15, diam. 42 mill.

Jamaica.

H. peracutissima AD., Proc. Bost. Soc. N. H. 1845, p. 15.—PFR., Monographia, i, p. 314; Conchyl. Cab. p. 300, t. 126, f, 9, 10.—REEVE, f. 224.—*H. straminea* ALBERS, Die Heliceen, p. 122.—*H. soror var,* FER., Hist. t. 54 A, f. 1–3.—*H. martiniana* PFR. Monogr. i, p. 314; Conchyl. Cab. p. 264, t. 120, f. 9–11.

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Allied to H. cara, from which it may be separated by the more acute carina, which is compressed into a knife-like margin, concave above and below. There is some variation in size, the form called *H. martiniana* by Pfeiffer being scarcely larger than H. cara, and, in fact, constituting a connecting link between the two species. The lip is sometimes white. The spire is often flatter than the figures show, and the umbilicus is as often open as closed.

H. CARA C. B. Adams. Pl. 36, figs. 37–39, 40, 41.

Umbilicate or imperforate, depressed, acutely carinated, obliquely striate and more or less granulated; chestnut brown, rarely olive-colored; spire low-conoidal; apex planulate; sutures linear; last whorl acutely carinated, scarcely descending anteriorly; peristome expanded, white or brown, basal margin reflexed, dilated partly or wholly over the umbilicus, quadri-dentate within, the inner tooth generally small, often obsolete, outer tooth sometimes obsolete, the two outer teeth nearer together and situated upon a narrower eminence than in H. peracutissima. Alt. 13, diam. 34 mill.

Jamaica.

H. cara AD. Contrib. to Conch. no. 2, p. 29. (1849.)—PFR., Monogr, iii, p. 216; Conchyl. Cab. t. 126, f. 11, 12.—REEVE, Conch. Icon. f. 223.—*H. amabilis* C. B. AD. Contrib. to Conch. no. 7, p. 105.

The carina is not pinched out into so acute a keel as in H. peracutissima. There is a var. *media* Ads, with light-colored carina (figs. 40, 41), which approaches somewhat H. soror. The whorl does not descend toward the aperture as in that species, however.

H. SOROR Férussac. Pl. 35, figs. 27–30.

Umbilicate, depressed, acutely carinated, solid, opaque, dark brown, except for a white or yellowish band in the middle of the whorl, above and below the carina; obscurely striated and granulated; spire low-conoidal; apex planulate; sutures linear; whorls 4 to 4½, flat, the last acutely carinated, slightly descending anteriorly; aperture very oblique, transverse; peristome white, expanded, basal margin subreflexed, nowhere adnate to the base except at the insertion, bearing inside four acute teeth, the inner one small, outer two situated upon a prominence, the three outer teeth marked outside the lip by three furrows or scrobiculations. Parietal callus light, thin, translucent.

Alt. 13, diam. 30 mill.; alt. 12, diam. 33 mill.

Jamaica.

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H. soror FER., Prodr. 118; Hist. t. 54, f. 43.—PFR. Symbolæ, iii, p. 80; Monogr. i., p. 401; Conchyl. Cab. t. 78, f. 3, 4.—REEVE, f. 238.—*Carocolla quadridentata* MKE., Cat. Malsb., p. 5 (teste Pfr.).

H. soror is more acutely carinated than H. schroeteriana, and the entire central part of the base is dark chestnut colored; whilst H. schroeteriana has only a dark band encircling the base, the circum-umbilical tract light. I have seen a few specimens of the last-named species in which the central part of the base is dark, and such shells can only be distinguished from H. soror by the more convex base and less acute periphery. None of the numerous specimens of H. soror before me have the umbilicus wholly covered.

H. SCHRŒTERIANA Pfeiffer. Pl. 36, figs. 31–36.

Umbilicate or imperforate, depressed, solid, opaque, somewhat shining, white, with two dark bands more or less marked zig-zagly with whitish flecks, one on the upper, one on the lower surface; obsoletely obliquely striate; obsoletely granulate; spire conoidal, low; apex obtuse; sutures linear; whorls 4½ to 5, flat, the last acutely carinated, somewhat deflexed anteriorly, with three deep grooves or scrobiculations behind the peristome; aperture very oblique, transverse; peristome brown or white, expanded, reflexed, somewhat thickened, and convex, lower margin with four teeth within, the inner small, often obsolete, the two outer joined at their bases; terminations of the peristome joined by a shining callus.

Alt. 14, diam. 30 mill.

Jamaica.

H. schrœteriana PFR., P. Z. S. 1845, p. 44; Conchyl. Cab., p. 66, t. 78, f. 5, 6; Monographia i, p. 403.—PHILIPPI, Abbild. u. Beschreib. ii, p. 185, Helix t. 9, f. 7.—*H. chittyana* C. B. AD., Contrib. to Conch., No. 2, p. 30.—REEVE, f. 240.

Nearly every specimen of this species shows, when closely examined, numerous radiating zig-zag whitish markings, appearing silvery upon the darker bands. Sometimes these markings are reduced to mere flecks; but every specimen in good condition I have seen shows this decoration. H. soror is sometimes somewhat flecked above, but never has radiating zig-zag markings beneath.

Var. CHITTYANA C. B. Ad. Pl. 27, figs. 67, 68.

Generally more globose than the type, imperforate (in the specimens I have seen) and conspicuously marked by radiating zig-zag silvery flames.

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H. TRIDENTINA Férussac. Pl. 35, figs. 22–26.

Narrowly umbilicate or imperforate, depressed-trochoidal, solid, opaque, shining, whitish, with two brown bands and a sub-sutural brown line; upper surface suffused with yellowish brown; surface nearly smooth, the delicate incremental striæ and granulation nearly effaced; spire conoidal, obtuse; apex planulate; sutures linear; whorls 4½ to 5, a little convex, the last more or less bluntly angular at the periphery, flattened beneath, descending anteriorly, deeply scrobiculate behind the peristome; aperture very oblique, transverse, oblong-truncate; peristome white or brown, expanded, reflexed, expanded and adnate at the insertion, nearly or entirely covering the umbilicus, the basal margin bearing inside three teeth, the two outer connected, arising from a common elevation. There is sometimes a minute fourth tooth developed near the insertion of the basal lip. Parietal wall with a light translucent callus.

Alt. 13–14, diam. 25 mill.

Jamaica.

H. tridentina FER., Histoire t. 54A, f. 4–6.—PFR. Symb. ii, p. 143; Monogr. i, p. 283; Conchyl. Cab., p. 65, t. 78, f. 1, 2.—PHILIPPI, Abbild., ii, p. 186, Helix t. 9, f. 8.—*H. swainsoniana* C. B. AD., Contrib. to Conch., No. 9, p. 169.—PFR. Monogr. iii, p. 260.—*H. browneana* PFR. Mal. Blät. ix, p. 152 (1862); Novit. Conch. i, p. 214, t. 57, f. 1–3.

This shell is more or less bluntly carinated; it is often more depressed than my figures, and as frequently more elevated. The umbilicus is nearly, sometimes wholly, covered by the expansion of the basal lip. The cuticle often shows alternating streaks of white and yellowish. These streaks are not so well defined as fig. 24 shows, but are irregular, zig-zag. There is a variety in which the upper band extends to the suture, and the lower to the center of the base (fig. 26). The following form is scarcely separable, even as a variety.

Var. BROWNEANA Pfr. Pl. 35, figs. 19–21.

Depressed, *imperforate*, obtusely carinated; body-whorl with a narrow brown band on the base, and a broad one above, beneath the suture; lip typically white, basal margin with four teeth, the inner one quite small. Alt. 11, diam. 23½ mill.

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Var. SUBSLOANEANA Pilsbry. Pl. 27, fig. 69.

The form is as in typical H. tridentina; spiral bands obscure or absent; the entire surface yellowish-brown, more or less obscurely streaked with lighter. General appearance much like H. sloaneana, but more carinate, perforate, and the basal lip tridentate.

Alt. 14, diam. 28 mill.

* * *

H. OKENIANA Pfeiffer. Pl. 34, figs. 8, 12, 13.

Imperforate, depressed; periphery rounded or obtusely keeled; solid, opaque, brownish above, paler beneath, all over very densely minutely granulate, the granules arranged in rows like incremental striæ; spire low, convex, rounded, apex plane, suture impressed at apical whorl, then becoming linear; whorls 4½ to 5, the apical slightly convex, the following flat, the last convex above and beneath, deeply deflexed anteriorly, deeply 3-grooved or scrobiculate behind the peristome, the outer groove the smallest. Aperture sub-horizontal, transverse-oval; peristome broadly expanded all around, adnate over the umbilicus, terminations joined by a parietal callus rather heavy at its edge; basal margin bearing four teeth within, the outer one quite small, joined to the third tooth by a common elevation. Alt. 15, diam. 34; alt. 17, diam. 37 mill.

Jamaica.

H. okeniana PFR. P. Z. S. 1845, p. 63; Monogr. i, p. 314; Conchyl. Cab. p. 440, t. 152, f. 11, 12.—REEVE f. 225.—*H. fortis* C. B. AD. Contrib. to Conch., No. 5, p. 77.—REEVE, f. 1476.

Quite a distinct form. Body-whorl convex, depressed orbicular, often slightly keeled. Whorls of the spire (except the apical two) flattened, as in the preceding species of this group; not convex, as they are in all of the following species. Outer tooth of basal margin, and the corresponding scrobiculation behind the peristome much smaller than the adjacent tooth, sometimes even obsolete. (*cf.* H. atavus, in which the outer tooth is as large as the adjacent one.)

H. ATAVUS Shuttleworth. Pl. 34, figs. 9–11.

Imperforate, depressed semi-globose, solid, slightly shining, upper surface brown, spire darker, periphery narrowly white banded, base paler; surface densely, minutely granulate all over, the granules in rows in the direction of incremental striæ; spire low, dome-shaped, obtuse; apex planulate; sutures not impressed except at tip and

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around the last whorl; whorls 4½ to 5, scarcely convex, slowly widening, the last convex, depressed-orbicular, bluntly keeled at the periphery, deeply deflexed anteriorly, tri-scrobiculate behind the peristome, the grooves nearly equidistant, inner one very short; aperture subhorizontal, transverse-oval; peristome brown or flesh-colored, broadly expanded, basal margin reflexed, adnate over the umbilicus, bearing within four acute teeth, the inner two near together, outer two *not united*, lamellar, acute.

Alt. 16–18, diam. 33 mill.

Jamaica.

H. atavus Shutt. in Mus. Cuming, PFEIFFER, Monographia, iv, p. 243; v, p. 316.

Pfeiffer is in error in referring Reeve's figure of H. fortis to this species. H. atavus may be known by the large size, dark spire and pale base, three outer teeth nearly equidistant, the outer two not situated upon nor connected by an elevation.

H SLOANEANA Shuttleworth. Pl. 38, figs. 67–70.

Imperforate, depressed-trochoidal, solid, opaque, shining, brown (often livid-brown, or olive-tinged brown) with a lighter peripheral fascia, and fading out in the center of the base; surface densely granulate, the granulation appearing often partly effaced; spire dome-shaped; low or rather elevated, obtuse; apex planulate; sutures scarcely impressed; whorls 5, slightly convex, the last obtusely keeled in the middle, descending at the aperture, deeply scrobiculate behind the peristome, the inner groove nearly concealed by the reflection of the lip, the outer two near together, occupying a single deep depression (not separated as in H. atavus); the grooves are subparallel; aperture subhorizontal transverse; peristome brown, broadly expanded, basal margin reflexed, adnate over the umbilicus, bearing four teeth within, the outer two connected at their bases, the inner tooth small, sometimes obsolete. Margins of peristome joined by a callous continued across the parietal wall from the upper termination of peristome.

Alt. 13–14, diam. 28–29; alt. 16, diam. 27 mill.

Jamaica.

H. sloaneana Shutt. in ALBERS, Die Heliceen (2d ed., 1861), p. 153.—PFR., Monogr. v, p. 316.—*H. bronni var β.* PFR. Monogr. iv, p. 243.—*H. schroeteriana*, REEVE, Conch. Icon. f. 236.

The points of difference noted in the above description will separate this form from H. atavus. The species is less globose than H.

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bronni, larger and browner on the base. H. valida is similar, but the body-whorl is not so depressed as in sloaneana. The teeth are not nearly so large in this shell as in H. sinuata, nor is the inner groove behind the peristome so long.

H. BRONNI Pfeiffer. Pl. 38, figs. 78–80.

Imperforate, globose-depressed or subtrochoidal, solid, opaque, shining, upper surface deep chestnut brown, periphery white, base white or yellowish except for a brown fascia revolving below the periphery; surface granulate (under a lens), the granulation usually nearly or entirely effaced, especially above; spire conoidal, obtuse, elevated or depressed; apex planulate, whitish; whorls slightly convex, slowly widening, the last scarcely wider than the penultimate; whorls 5 to 5½, the last deeply deflexed anteriorly, rounded (or faintly keeled) at the periphery, deeply scrobiculate behind the peristome; aperture subhorizontal, transverse; peristome broadly expanded, thickened, basal margin reflexed, widening toward the insertion, adnate over the umbilicus, bearing within four teeth, regularly decreasing in size from the outer to the inner one; evenly spaced, the outer two connected at their bases. Lip white and brown; its upper termination continued in a heavy callous halfway across the parietal-wall toward the axis.

Alt. 13–16, diam. 24 mill; alt. 16, diam. 26 mill.

Jamaica.

H. bronni PFR. Monogr. i, p, 305; Conchyl. Cab. p. 109, t. 15. f. 9, 10; t. 153, f. 4.—REEVE, f. 241.

Closely allied to H. sloaneana, but smaller, more elevated, with shorter aperture, more thickened and broader basal lip.

H. STRANGULATA, C. B. Adams. Pl. 36, figs. 42–46.

Imperforate, globose, solid, opaque, dull, chocolate-brown, base usually paler; surface microscopically granulated all over; spire convex, low, obtuse; apex planulate; sutures impressed; whorls 5, convex, slowly widening, the last subglobose, rounded at the periphery, deeply deflexed anteriorly, indented behind the peristome by two curved converging furrows; aperture subhorizontal, transverse; peristome broadly expanded, soiled whitish, basal margin reflexed, adnate over the umbilicus, bearing within four tortuous lamellar teeth, the inner one very close to the insertion. Parietal-wall traversed by a heavy callous continued downward from the upper termination of the peristome. Alt. 15, diam. 24 mill.

Jamaica.

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H. strangulata, AD. Contrib. to Conch. no. 2, p. 31.—PFR. Monogr. iii, p. 211; Conchyl. Cab. p. 445, t. 153, f. 10, 11.—REEVE f. 244.—GLOYNE, Journ. de Conchyl. XX, p. 30.

Separated at once from other species by the *two* curved converging furrows behind the peristome; H. bronni and other forms of like outline having three furrows.

H. VALIDA, C. B. Adams. Pl. 35, figs. 14–18.

Imperforate, globose-depressed or subtrochoidal, solid, opaque, dark-brown generally lighter beneath, and with a lighter peripheral band; surface densely finely granulate; spire elevated, obtuse, apex planulate, polished, sutures impressed; whorls 5, gradually increasing, convex, the last globose-depressed, rounded at the periphery, often encircled there by a trace of a carina, deflexed anteriorly, with two deep pits behind the peristome, the outer one formed by two furrows; aperture subhorizontal, transverse; peristome broadly expanded, brown, basal margin reflexed, bearing within four teeth, the two outer united at their bases, the inner tooth small. Alt. 18, diam. 30–34 mill.

Jamaica.

H. valida AD. Contrib. to Conch. No. 5, p. 77.—PFR. Monogr. iii, p. 210; Conchyl. Cab. p. 443, t. 153, f. 6, 7.—REEVE, f. 245.

Some specimens show a slight trace of a furrow above the periphery, behind the peristome. It is closely allied to H. bronni, but is larger, differently colored and more obviously granulated. The peristome does not become thickened upon its face as it does in H. bronni. A small form before me measures alt. 16, diam. 24 mill.

H. PICTURATA C. B. Adams. Pl. 37, figs. 47–53.

Imperforate or narrowly umbilicate, depressed, solid, chestnut-brown, marked above and below with irregular longitudinal silvery stripes; surface densely, finely granulate; spire convex, obtuse; apex flat, glossy, corneous; sutures slightly impressed; whorls 5, slightly convex, slowly widening, the last depressed, rounded or subcarinated at the periphery, deeply descending anteriorly, constricted by three deep furrows behind the peristome. Aperture subhorizontal, oblong-wedge-shaped, transverse; peristome broadly expanded, basal margin reflected, bearing within four strong entering lamellar teeth, the outer two slightly connected at their bases. Alt. 12–13, diam. 24–26 mill.

Jamaica.

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H. picturata Ad., Contrib. to Conch, p. 30, 40, 98. (Oct. 1849.)—Pfr., Monogr. iii, p. 212; iv, p. 214; v, p. 316; Conchyl. Cab. t. 153, f. 12.—Reeve, f. 235.—*H. sinuata* Delessert, Recueil. t. 26, f. 10.—Pfr. in Conchyl. Cab. t. 15, f. 5, 6.—Chenu, Ill. Conch., Helix, t. 12, f. 10.—*H. sinuata var. β*, Pfr. Monogr. i, p. 305.

This beautifully-decorated species need not be compared with H. sinuata and its allies, for it lacks the short furrow above the periphery behind the aperture which those forms possess. H. valida, H. bronni and H. strangulata are its nearest allies, but all of them have the *two outer teeth united at base*, while in H. picturata the union is very slight. Fig. 51 represents a form without the characteristic color-markings; such shells may still be known by the other peculiarities just mentioned. Umbilicated specimens are much less common than imperforate ones. The smallest specimens of the species I have seen measure, alt. 10, diam. 18 mill.

H. pallescens Shuttleworth. Pl. 37, figs. 54–60.

Separated from all other species which lack a furrow above the periphery behind the peristome, by the wider umbilicus, and the development of the parietal margin of the aperture; peristome solute; free from the body-whorl.

Umbilicate, depressed, solid, nearly lusterless, light-yellowish, sometimes tinged above with brownish; all over densely, finely granulate; spire low, slightly convex; apex smooth, light colored; planulate; sutures well impressed from the beginning; whorls nearly 5, convex, slowly widening, the last wider, but decidedly narrowed as it nears the aperture, convex below, rounded or obscurely carinate at the periphery, deeply, abruptly descending anteriorly, constricted by three deep furrows behind the peristome; aperture subhorizontal, light-brownish or cream-colored within, transverse, wedge-shaped; peristome sinuous, broadly expanded, its face thickened, produced, solute, continuous, free from the preceding whorl, its basal margin bearing within four strong pliciform obliquely-entering teeth. Alt. 12–14, diam. 25–27 mill.

Jamaica.

H. pallescens Shutt. (in Mus. Cuming) Pfr., Monographia iv, p. 309; v, p. 413.

* * *

H. sinuata Müller. Pl. 27, figs. 72–75.

H. sinuata, simson, invalida, sinuosa and anomala form a little group of species characterized by a short furrow above the periph-

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ery of the whorl a short distance behind the aperture. The two outer teeth are much united at their bases; and there is often an accessory denticle between the inner and the second tooth.

Nearly always imperforate, rather globose, strong, opaque, shining, dark-brown, apex and a peripheral fascia generally white, base usually lighter; surface minutely, densely granulate; spire low dome-shaped, apex planulate, polished, sutures impressed; whorls 4½ to 5, convex, very gradually widening; body-whorl subdepressed, rounded at the periphery, often with an obsolete peripheral carina, deeply deflexed at the aperture, deeply scrobiculate behind the peristome, the furrows rather longer than in H. simson. Aperture subhorizontal, transverse, somewhat wedge-shaped; peristome flesh-colored, broadly expanded, basal margin reflexed, adnate over the umbilicus, bearing within four lamellar entering teeth, *the outer one at its inward extremity strongly bent outward*, the middle two entering obliquely toward the axis, the inner tooth smallest, not directed toward the axis, *separated from the second tooth by a broader space than the spaces separating the remainder of the teeth*, this space sometimes bearing a small denticle in the middle; two outer teeth not united at their bases; terminations of peristome united by a parietal callous, continued from the upper margin of the peristome.

Alt. 16, diam. 27 mill.

Jamaica.

H. sinuata MULLER ("Hist. Verm. ii, p. 18, 1773"), PFEIFFER, Monographia, i, p. 305 (excl. varr.); Conchyl. Cab. p. 79, t. 10, f. 5, 6. (teste Pfr.), t. 153, f. 5; l.c. p. 445.—REEVE, f. 243.—*H. propenuda* AD. Contrib. to Conch. no. 5, p. 79.—PFR. Monogr. iii, p. 212.

Note the passages above italicized. There is great variation in dimensions and degree of depression. Umbilicus is rarely partly open. The smallest specimen before me measures, alt. 12, diam. 21 mill.

Var. PROPENUDA Ad.

Shell like H. sinuata, but the color is very pale, almost white except on the upper whorls; aperture more contracted; the exterior furrows are very short, and the right pair of teeth a little joined at base. Imperforate. (*Ad.*) Quite a distinct color variety.

H. SINUOSA Férussac. Pl. 27, figs. 76–79; pl. 38, figs. 76–79.

More depressed than H. sinuata, umbilicate; the outer tooth of aperture not flaring outward at its inner extremity, or only slightly

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so, nearly parallel with the adjacent two teeth. The four teeth are almost equally spaced.

Umbilicate, depressed, obtusely carinated, minutely granulated all over, dark-brown, often with a light peripheral fascia; whorls about 5, the apical two convex, shining, the others flatter than in H. sinuata, scarcely convex, slowly widening, the last more depressed than that of H. sinuata, deeply tri-scrobiculate behind the peristome, deeply deflexed anteriorly; aperture subhorizontal, oblong wedge-shaped; peristome broadly expanded, basal margin reflexed, partly concealing the deep broad umbilicus, quadri-dentate within, the teeth equally spaced, lamellar, entering, nearly closing the aperture, the outer largest, inner smallest, outer tooth a trifle turned outward at its inner termination, not nearly so decidedly so as in H. sinuata. Terminations of peristome united by a more or less elevated parietal callous. Alt. 13, diam. 28–30 mill.

Jamaica.

H. sinuosa FER. Hist. t. 54, f. 3.—PFR. Monogr. iii, p. 259; iv, p. 309; v, p. 413; Conchyl. Cab. p. 279, t. 122, f. 14, 15.—*H. consanguinea* C. B. AD. Contrib. to Conch. no. 9, p. 170.—*H. simson* PFR. Zeitschr. f. Mal. 1852, p. 92; Monogr. iii, p. 211; Conchyl. Cab. t. 153, f. 8, 9.

This species forms a transition stage between H. sinuata and H. anomala. It is rarely imperforate. I have before me a variety of H. sinuata which resembles sinuosa in having a broad umbilicus, but it has the outer tooth of basal lip bent outward at its inward extremity as in typical sinuata. The best differential characters for separating the two forms are found in the equally-spaced teeth of H. sinuosa, all four of them nearly parallel.

A small variety is imperforate, and measures, alt. 12½, diam. 23 mill.

VARIETY. Pl. 38, figs. 74–77 represent a form which has a well-developed accessory tooth between the first and second teeth of the base. It is otherwise like the type,

Var. SIMSON Pfr. Pl. 38, figs. 71–73.

Similar in all respects to H. sinuosa except that *it is more elevated, body-whorl less depressed,* outer two teeth united at their bases.

Alt. 16, diam. 28 mill; alt. 15, diam. 25 mill.

The elevated form of typical shells of this variety reminds one of H. valida Ad.

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H. INVALIDA C. B. Adams. Pl. 38, figs. 81–86.

Smaller than the several preceding forms; outer two teeth united at their bases as in H. simson; inner tooth small, often wanting; teeth smaller, not extending nearly so close to the parietal wall as in the several preceding species.

Imperforate, rarely umbilicate, depressed-globose, solid, opaque, somewhat shining, chestnut-brown, with a peripheral light fascia, base somewhat paler; surface densely finely granulate; spire more or less elevated, obtuse; apex glossy, corneous; sutures somewhat impressed; whorls 4½, slightly convex, slowly widening, the last rounded or obtusely carinated at the periphery, deeply deflexed anteriorly, tri-scrobiculate behind the peristome, and with a slight short furrow above the periphery behind the aperture; aperture subhorizontal, oblong-wedge-shaped; peristome broadly expanded, brown; basal margin bearing four equally-spaced teeth within, the outer two united at their bases. Parietal callous elevated at its junction with the upper termination of the peristome.

Alt. 11–12, diam. 20–22 mill.

Jamaica.

H. invalida AD. Contrib. to Conch. no. 5, p. 79.—PFR. Monogr. iii, p. 212; Conchyl. Cab. p. 447, t. 153, f. 14–16.—REEVE, f. 242.—*H. candescens* AD. Contrib. to Conch. no. 5, p. 80.

Var. CANDESCENS Ad.

Lighter colored than the type, the base white; peristome white.

An umbilicate specimen is figured (fig. 81), and a three-toothed specimen (fig. 82).

H. ANOMALA Pfeiffer. Pl. 37, figs. 61–66.

Separated from the preceding forms by the extraordinary development of the peristome, which is in every part free from the preceding whorl.

Broadly umbilicate, depressed, solid, nearly lusterless, dark purplish-brown with a narrow white peripheral stripe, all over densely, finely granulate; spire nearly planorboid or a little convex; apex polished, generally white; sutures impressed; whorls 4½, convex, slowly widening, the last very deeply descending anteriorly, convex below, constricted behind the peristome by four deep furrows, and a less conspicuous short furrow just above the periphery; aperture subhorizontal, oblong-wedge-shaped, brown within; peristome light-brown, expanded, produced beyond the expansion and expanded a

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second time, solute, free from the whorl, continuous; throat obstructed by four lamellar entering teeth, the inner smallest. Umbilicus broad or narrow, deep. Alt. 11–13, diam. 23–30 mill.

Jamaica.

H. anomala PFR. P. Z. S. 1848, p. 110; Zeitschr. f. Mal. 1848, p. 119 (excl. var. β.); Monogr. iii, p. 258; Conchyl. Cab. p. 279, t. 122, f. 11–13.—REEVE, Conch. Icon. f. 246.

Section VII. CARACOLUS Montfort, 1810.

Caracolus MONTF. Conch. Syst. ii, p. 138.—ALBERS-MARTENS Die Heliceen, p. 156 (1861).—SEMPER, Reisen, etc., Land-mollusken, ii Heft, p. 104 (1873).—W. G. BINNEY, Ann. N. Y. Acad. Sci. iii, p. 92 (1884).—PFEIFFER-CLESSIN, Noment. Hel. Viv. p. 177 (1878).—*Carocolla* SCHUMACHER, Essai d'un Nouv. Syst. vers test., p. 192 (1817)—and of LAMARCK, CUVIER, MÖRCH, ALBERS, BECK and others.—*Serpentulus* "Klein" H. AND A. ADAMS, Gen. Rec. Moll. ii, p. 201.—*Lampadion* BOLTEN (in part only) Mus. p. 77.—GRAY, P. Z. S. 1847, p. 173.—*Discodoma* SWAINSON, Treatise on Malacol. p. 329 (1840).

A group of large, trochoidal, strongly-carinated species inhabiting Hayti, a few of the adjacent Virgin Islands, and the extreme eastern part of Cuba. The acutely carinated low-conoidal form, strong, solid texture, transverse aperture with wholly toothless margins, will separate the section from other members of the group. The colors are usually dark and (except in H. marginella) rather dull. The species are not at all well defined, and a reduction of them, even greater than that made in the following pages, might be accomplished when larger collections from all parts of Hayti are obtained. The synonymy here given is based upon a study of hundreds of examples; and no species (with the exception of one mentioned in the text, *H. bizonalis* Desh.) has been reduced to a synonym, except after the examination of numerous absolutely intermediate examples uniting it with other forms.

In the following synopsis I have attempted to give diagnostic characters of each species in small compass. In doubtful cases it will be necessary to refer to the detailed descriptions.

H. carocolla L. Spire rather straightly conical; whorls slowly widening; *base quite decidedly and deeply indented* around the (usually) covered umbilicus; surface usually dull, obliquely

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wrinkled by incremental lines; parietal callus under a strong lens seen to be *very densely, very minutely granulate*, the granules standing very closely on a bright, polished ground, not elongated into wrinkles. Color, dark chestnut.

H. excellens Pfr. Spire *concave-conoidal;* whorls slowly widening; *base flattened, scarcely at all indented around the axis;* surface smoother and more shining than in H. caracolla; peristome and parietal callus orange-brown; parietal wall under a strong lens appearing nearly smooth, but really granulate, the granulation excessively minute, much finer than in H. carocolla. Aperture more triangular and narrower than in either carocolla or insititia; *upper margin of peristome straight.* Color dark-chestnut, outer whorl sometimes faintly olive-tinged.

H. insititia Shutt. Spire rather straightly conoidal; whorls more rapidly widening than in the two preceding; base as in H. excellens; surface comparatively smooth and shining; peristome white or brownish; parietal wall under a lens seen to be smooth or nearly so. Aperture not so narrow or triangular as in H. excellens; *the upper margin of peristome curved.* Color olive-green, inner whorls brown or reddish; sutures margined with yellow.

H. sarcocheila Mörch. Form of spire as in H. carocolla; *base scarcely indented around the axis;* surface markings and coloration as in carocolla; peristome white or pale; parietal callus *more decidedly rugose* than in any other species, *the granules elongated, and larger than in H. carocolla. Aperture narrower than in H. carocolla, but wider than that of H. excellens.* Upper margin of peristome slightly curved. Color uniform olive-brown.

H. angistoma Fér. Depressed, acutely carinated, lens-shaped, nearly as convex below as above; surface decussated, at least in places; whorls narrow, the several outer ones of equal width; aperture narrow, parietal callus strong.

H. marginella Gmel. Smaller than most of the preceding; spire conoidal; surface obliquely striate above, smoother beneath; periphery carinated; base convex, indented around the axis, which is often umbilicate; *peristome narrowly expanded all around,* thickened. Color generally light bright-yellow, with conspicuous spiral dark zones.

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H. CAROCOLLA Linné. Pl. 21, figs. 1, 2, 5, 6, 7; pl. 24, fig. 89.

Imperforate (rarely narrowly perforate), depressed-conoidal, solid, strong, opaque, lusterless, chestnut-brown, often with a slightly darker zone below the periphery; irregularly obliquely striate, under a strong lens showing minute decussating short wrinkles; spire conical, obtuse, apex depressed, planulate; sutures linear; whorls 6, gradually widening, the last not descending anteriorly, strongly carinated at the periphery, flattened beneath and indented in the center around the axis; aperture very oblique, subtriangular-lunar, bluish or purplish-white within; peristome white or slightly flesh-tinted, upper and outer margins obtuse, not expanded, basal margin slightly expanded, thickened, dilated over the umbilicus; margins of peristome remote, ends connected by a thin callous.

Alt. 25–30, diam. 50–60 mill.

Porto Rico; Viéque; Crab Island; fossil on St. Croix.

H. carocolla LINN. Syst. Nat. x, p. 769.—PFR. Monogr. i, p. 20; Conchyl. Cab, t. 8, f. 1, 2.—FER., Hist., t. 59, f. 3–4.—REEVE, Conch. Icon. f. 227.—*Caracolus caracolla* SEMPER, Reisen in Philippinen, Land-mollusken, ii, p. 104, t. 12, f. 13, t. 16, f. 8. (Anatomy).—*H. tornata* BORN, Mus. test. Cæs. t. 14, f. 9. 10.—*Carocolla albilabris* LAM. An. s. Vert. ii, p. 96.—*Caracolus oculatus* MONTF. Conch. Syst. ii, p. 139.

The outlines of the spire are straight or slightly convex, never very noticeably concave. The whorls increase more gradually than in H. insititia Shutt.

H. EXCELLENS Pfeiffer. Pl. 25, figs. 51–53.

Imperforate, depressed, *concave-conoidal*, solid, slightly shining, deep chestnut-brown, usually tinged with olive on the outer whorls; surface obliquely striatulate, smoother than in H. carocolla, and generally showing under a strong lens minute decussating scratches; spire conoidal, with concave lateral outlines; apex obtuse, subplanulate; sutures linear; whorls 6, gradually widening, the last depressed, carinated, wider than in H. carocolla, and flatter or subconcave on its upper surface; shortly deflexed anteriorly; aperture *triangular*, very oblique, very broad and low, transverse, livid within; peristome dark orange-brown or liver-colored, upper margin obtuse, *straight;* basal margin slightly expanded, thickened, only slightly curved; parietal callus straight, dark colored.

Alt. 25–27, diam 58–63 mill.

Hayti.

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H. excellens PFR. Zeitschr. f. Mal. 1852, p. 133; Conchyl. Cab. t. 161, f. 12; Monographia iii, p. 166.

May be separated from H. carocolla by the narrow triangular aperture, concave spire, smoother surface, etc. See analysis of species on page 119.

H. INSITITIA Shuttleworth. Pl. 21, figs 3, 4; pl. 24, figs. 35–38.

Imperforate, depressed-conoidal, solid, shining, dark brownish-olive, sutures margined with yellow, inner whorls brown or reddish; surface striatulate, about as smooth as in H. excellens. Spire conical, outlines nearly straight; apex depressed, subplanulate; sutures linear; whorls 5½, slightly convex, the outer ones wider than in H. carocolla; body-whorl acutely carinated, depressed, a trifle descending anteriorly, flattened beneath, and a little indented in the center around the axis, but less so than H. carocolla; aperture very oblique, subtriangular, livid within; peristome white or livid-brown; upper margin blunt, curved (not straight as it is in H. excellens), basal margin slightly expanded, thickened; terminations of peristome joined by a rather heavy whitish callus, which under a strong lens seems to be smooth or nearly so. Alt. 24, diam. 47–50 mill.

Hayti.

H. insititia SHUTT. Diagn. no. 6, p. 133.—PFR. Monogr. v, p. 262.—*H. carocolla var.* PFR. Monogr. iii, p. 166.—*H. carocolla* REEVE, Conch. Icon. f. 227.

Distinguished by the decidedly olive-green color, smooth parietal callus, margined sutures and rapidly widening whorls. Some specimens are more brown than green, and the yellow subsutural margin is sometimes not very prominent. See under H. carocolla. The species is often more depressed than either of my figures.

H. SARCOCHEILA Mörch. Pl. 56, figs. 1, 2.

Imperforate, depressed-conical, solid, somewhat shining, dull chestnut-brown, sometimes a trifle tinged with olive, obliquely striate like H. carocolla, and with microscopic decussating scratches; spire rather straightly conical, apex rounded, depressed, subplanulate; sutures linear; whorls 5½ to 6, a little convex, the last rather wide, depressed, acutely carinated, not descending anteriorly, scarcely indented around the axis; aperture quite oblique, trigonal-lunate, livid-white within; peristome white or slightly flesh-tinted, upper margin obtuse, slightly curved, basal margin expanded, thickened,

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arcuate; terminations of lip distant, joined by a shining white callus, which shows a short distance within, under a lens, a peculiarly elongated, wrinkle-like dense granulation, coarser than in any of the preceding species of Caracolus.

Alt. 30–31, diam. 57–63 mill.

Hayti.

H. sarcocheila MORCH, Cat. Kierulf., p. 28, t. 1, f. 1.—PFR., Zeitschr. f. Mal. 1852, p. 132; Conchyl. Cab. p. 494, t. 161, f. 13; Monogr. iii, p. 165.

Separated from the other species by the coarser granulation of the parietal wall. The species is otherwise closely allied to H. insititia. See remarks on page 119.

H. ANGISTOMA Férussac. Pl. 21, figs. 8–10.

Imperforate, depressed, acutely carinated, solid, brown, with more or less distinct darker bands above and below the carina; surface obliquely delicately striate, *decussated by spiral lines* (under a lens); spire low-conoidal; apex planulate; suture linear; whorls about 6, flat, *very gradually increasing, the outer three equal in width;* last whorl not descending anteriorly, convex beneath, not indented in the center; aperture small, narrow, transverse-subtriangular, oblique; peristome considerably thickened, especially below, slightly expanded, white or brown, the terminations distant, joined by a heavy parietal deposit of callus. Alt. 17–20, diam. 42–43 mill.

Hayti.

H. angistoma FER., Hist. t. 60, f. 1.—PFR., Conchyl. Cab. p. 62, (t. 8, f. 9?); Monogr. i, p. 21.—REEVE, f. 206.—(*H.* "*angystoma*" Desh.)—*Caracolla angistoma* LAM. An. s. Vert. iii, p. 96.—(*H.* "*anchistoma*" Mart.)

A more distinct form than either of the preceding; distinguished by the narrow subequal whorls, narrow aperture,—even more contracted than in H. excellens. It is a rather rare form.

H. MARGINELLA Gmelin. Pl. 22 and 23; pl. 55, figs. 1-3, 6-11.

Umbilicate or imperforate; conoidal or flattened-conoidal; somewhat shining; solid; surface striate or decussated; apex white or corneous, planulate; whorls 5, last whorl acutely carinated, a little descending anteriorly; aperture very oblique, transverse triangular-oval; peristome somewhat expanded all around, white or brown; color yellowish, with well-defined contrasting dark zones.

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After studying a suite of several hundred specimens of banded *Caracolus* from numerous localities, I am disposed to unite all of the forms under the oldest name, *maraginella*. I am convinced that there are no characters in the shells, either of contour, sculpture or color, which do not absolutely and by imperceptible degrees shade from one form into another. Intermediate and transition forms are numerous. The following descriptions are taken from typical examples of the several varietal forms. All Cuban *Caracolus* have already been united by Arango under the name of *H. sagemon* Beck. I have found it necessary to entirely revise the nomenclature and synonymy of the varieties, and have given to the bibliography of the group an amount of time and labor all out of proportion to the apparent results.

The synonymy of each of the varieties recognized is given in a separate paragraph.

(*Typical marginella.*)

H. marginella GMEL. Syst. Nat. xiii, p. 3622 (1789).—*H. marginata* BORN, Mus. Cæs. Vind. Test., t. 14. f. 7, 8. (not *marginata* Müller).—FER. Hist. t. 63, f. 3, 4, 5, 6.—ORB. Moll. Cuba, t. 9, f. 11–13. (*Carocolla marginata* Lam., *Discodoma marginata* Swains.)—*H. marginata Bornii* CHEMNITZ, Syst. Conchyl. Cab. ix, p. 80, t. 125, f. 1097.— ?*H. fasciata* Blainv. Man. de Malacol. p. 460, t. 39, f. 3. (1825).—*Caracolla indiscreta* BECK, Index, p. 31 (no desc.).—*H. sagemon* BECK, Index, p. 31 (founded on the same figure Gmelin cites for his *H. maraginella*!)—PFR. in Conchyl. Cab. p. 96, t. 13, f. 3, 4.—*H. arangiana* POEY, Memorias, i, p. 410.—PFR. Monogr. iv, p. 237; Novit. Conch. iii, p. 395, t. 92, f. 7, 8.—*H. marginatoides* ORB., Moll. Cuba, t. 5, f. 8–10.—*H. arangiana var. semiaperta* MARTENS in Novitates Conchologicæ v, p. 33, t. 144, f. 15–18 (1877).

(*Var. gutierrezi Poey.*)

H. gutierrezi POEY, Memorias i, p. 411, t. 25, f. 5–8.—PFR. Monogr. iv, p. 239; Novit. Conch. iii, p. 395, t. 92, f. 3–6.

(*Var. schwartziana Pfr.*)

H. schwartiziana PFR. Malak. Bl. xi, p. 125 (1864); Novit. Conch. i, p. 269, t. 67, f. 1, 2.

(*Var. mina Pfr.*)

H. mina PFR. Zeitschr. f. Mal. 1852, p. 92; Conchyl. Cab. p. 261, t. 136, f. 16, 17; Monographia iii, p. 205.—*H. marginata* D'ORB. Moll. Cuba, t. 9, f. 11–13 (not *marginata* Müll.)

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H. jactata (Gundl. mss.) Pfr. Malak. Bl. v, p. 175, 1858; Monogr. v, p. 309; Novit. Conch. iii, p. 391, t. 90, f. 9–11.

(*Var. rostrata Pfr.*)

H. rostrata PFR. Zeitschr. f. Mal. 1847, p. 12; Conchyl. Cab. p. 117, t. 86, f. 3–5; Monogr. i, p. 22.—*H. marginata var.* FER., Hist., t. 63, f. 9, 10.—*H. sagemon var.* REEVE, Conch. Icon. f. 203 b.—*H. pazensis* POEY, Memorias, i, p. 410, t. 33, f. 2, 3.—PFR. Monogr. iv, p. 238; Novit. Conch. iii, p. 393, t. 91, f. 5, 6; t. 92, f. 1, 2.

(*Var. marginelloides d' Orb.*)

H. marginelloides ORB. Moll. Cuba, i, p. 154, t. 9, f. 14–16.—POEY, Memorias i, p. 409.—PFR. Monogr. iv, p. 237; Novit. Conch. iii, p. 394, t. 91, f. 7–12—*H. transitoria* Pfr. Monogr. iv, p. 301; Malak. Bl. 1855, p. 99.

(*Var. bornii Pfr.*)

H. bornii "Chemnitz" PFR. Monographia i, p. 191 (excluding synonymy!); *H. marginella* PFR. Monogr. iv, p. 301; v, p. 401.—BLAND, Ann. Lyc. N. H. of N. Y., xi, p. 80. (not *marginella* Gmel. See above.)

(*Var. bizonalis Desh.*)

H. bizonalis DESH. in Fér. Hist. p. 68.—PFR. Monogr. iii, p. 241; Conchyl. Cab. p. 401, t. 145, f. 10, 11.—BLAND, Ann. Lyc. N. H. of N. Y. xi, p. 81, (1874).—*H. marginata var.* FER. Hist., t. 63, f. 11, 12.

(*Var. gaskoini Pfr.*)

H. gaskoini PFR. P. Z. S. 1851, p. 260; Monogr. iv, p. 263.—REEVE, Conch. Icon. f. 286.—BLAND, Ann. Lyc. N. H. of N. Y., xi, p. 80. (1874.)

Var. MARGINELLA Gmel. (Typical). Pl. 55, figs. 1–3.

Imperforate or nearly covered perforate; moderately conoidal; last whorl acutely carinated, more or less gibbous and deflexed at the aperture; color usually yellowish with a broad zone on each side of the periphery, often divided into two by a peripheral light line or a peripheral light zone, the carina light or edged with brown. Aperture moderately angular at position of periphery; lip white or nearly so. Alt. 18, diam. 35 mill.

Eastern Cuba.

This is not the H. marginella of Pfr. It is H. sagemon of Beck and authors, and H. arangiana Poey, Pfr. and others.

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Var. *semiaperta* von Martens (pl. 56, figs. 3–5) seems to be a form of this variety in which the umbilicus is wider than usual, approaching in this respect H. transitoria Pfr. and H. bornii Pfr. The characters are sufficiently shown by the figures. It is said to be from *Hayti*.

Var. GUTIERREZI Poey. Pl. 22, figs. 12–15.

Imperforate or nearly covered perforate; base black, with a narrow peripheral lighter zone and a small umbilical light tract; upper surface with a blackish band revolving in the center of each whorl. Aperture as in H. marginella, but often not angular at outer margin, and the lip generally brown.

Eastern Cuba.

Scarcely to be distinguished from var. marginella, but a little differently colored. Specimens of a uniform yellow color are not rare.

Var. SCHWARTZIANA Pfr. Pl. 22, figs. 16, 17.

Imperforate, small, conoidal; surface generally decussated; *color deep brown or black* except a narrow subsutural light line, a small umbilical tract, and the white apical whorls.

Alt. 18, diam. 27 mill.

Jojo, S.-E. Cuba.

Var. MINA Pfr. Pl. 22, figs. 20, 20a.

Imperforate or umbilicate; conoidal-depressed; *surface generally decussated above* especially the last whorl, which is somewhat dilated and flattened behind the aperture; color yellow, with a subsutural brown zone, a blackish zone in the middle of the upper surface of the whorls, and a similar one beneath the periphery; the acute carina is edged with a brown line. Peristome white.

Alt. 16–18, diam. 36 mill.

Eastern Cuba.

Small examples are frequent; they are often more depressed than the types, the last whorl becomes rounded on its last third, and the

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surface is cut into square granules by the intersection of oblique with spiral impressed lines.

A specimen measures, alt. 15, diam. 27 mill.

H. jactata Gundl. (pl. 22, t. 23–25) is the same.

Var. ROSTRATA Pfr. Pl. 23, figs. 34, 34a.

Imperforate, large, not decussated, very acutely carinated; color yellowish, with a band above and one below, these blackish bands sometimes covering the whole surface. Aperture subhorizontal, transverse, outer margin at the periphery produced into a recurved angular rostration; peristome white.

Alt. 20, diam. 42 mill.

Eastern Cuba.

There is a conical elevated variety called by Pfeiffer var. *cupulata* (pl. 22, figs. 22, 22a).

The *H. pazensis* Poey (pl. 23 figs. 32, 32a, 33, 33a) is a form of Var. rostrata. The base is black except a narrow peripheral light brown band; the upper surface is yellowish, with a broad blackish band in the middle of each whorl, and (usually) a narrow brown line on the carina. A very beautifully painted form of pazensis is shown in figs 10, 11, of pl. 55. The center of the base and a subsutural zone are reddish-brown; the carina is brown, with yellow zones above and below it. The color bands are very bright and sharply defined.

Var. MARGINELLOIDES d'Orb. Pl. 23, figs. 26–28.

Imperforate, rather large, depressed-conoidal acutely carinated; base deep brown, slightly lighter at periphery and around umbilicus; upper surface brown, with a blackish zone revolving near the lower margin of each whorl. Peristome white; its outer margin rounded or angular at position of the periphery. Alt. 17, diam. 37 mill.

Eastern Cuba.

The form called *H. transitoria* by Pfeiffer (pl. 23, figs. 29, 30, 31, 31a) differs in being broadly umbilicated, with smaller aperture; the ground-color is light yellow, with a broad blackish zone below and one above the periphery. The bands are sometimes absent, but

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when present are well defined, not shading into the ground-color as in var. marginelloides.

Var. BORNII Pfr. Pl. 55, figs. 6–9.

Umbilicus rather broad and deep; *form depressed;* acutely carinated; last whorl moderately deflexed anteriorly; surface obliquely striate; color yellowish, with one deep brown zone above and one below the carina, the zones sometimes very wide, almost covering the whole surface. Aperture trigonal-oval, transverse, not conspicuously angled at the position of peristome; peristome expanded, somewhat thickened, convex, white, not adnate over the umbilicus. Alt. 16, diam. 37 mill.

Porto Rico; Viéque.

Var. BIZONALIS Desh. Pl. 22, figs. 18, 19.

Umbilicate, depressed, *obtusely* angled at the periphery; obliquely striate; yellowish, with two deep brown zones, one above, one beneath; outlines of spire convex; last whorl slightly deflexed anteriorly; aperture subhorizontal, transverse-oval, not angled at position of periphery; expansion of columellar lip partly covering the umbilicus. Alt. 14–15, diam. 29–32 mill.

Hayti.

Separated from other varities by the almost rounded periphery. Not a common species- I have not traced the forms uniting this with the acutely carinated types. It is therefore more distinct than the other forms.

Var. GASKOINI Pfr. Pl. 22, fig. 11.

Umbilicate, turbinate-depressed, solid *obliquely rugose-plicate, above;* shining, *white;* spire conoid, obtuse; whorls 5½, convex, the last deflexed anteriorly, carinated; base slightly convex, nearly smooth; aperture very oblique, lanceolate-oval, peristome narrowly expanded, somewhat thickened, the terminations converging, joined by a white callus; basal margin reflexed, half covering the narrow umbilicus. Alt. 15–17, diam. 30–31 mill.

Hayti.

May be known by the conoidal form, strong incremental folds of the upper surface, absence of color, etc. It is doubtless, as Bland supposed, a form of H. bizonalis, and connects that variety with the more sharply carinated forms of Caracolus marginella.

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Section VIII. Oxychona Mörch, 1852.

Oxychona Morch, Cat. Yoldi, p. 14 (1852).—H. and A. Ad. Genera Rec. Moll. ii, p. 194.—Pfeiffer, Malak. Bl. xxiv, p. 8 (1877).—Pfeiffer-Clessin, Noment. Hel. Viv., p. 198 (1878).—Fischer, Manuel de Conchyliologie, p. 471 (sect. *Helicogena*). (1885).—Tryon, Structural and Systematic Conchology, iii, p. 36. —*Geotrochus* (in part) Albers, Die Heliceen, p. 114 (1850).—Albers-Martens, Die Heliceen, ed. 2, p. 167 (1860).—Crosse et Fischer, Moll. Mex. et l'Amer. Cent., i, p. 291.—Woodward, Manual of Moll. p. 162 (1854).—*Leptoloma* (in part) Albers-Martens, Die Heliceen, p. 167 (1860).—Pfeiffer-Clessin (in part) Noment, Hel. Viv., p. 159 (1878).—*Corasia* (in part) Crosse et Fischer, Moll. Mex. et dans l'Amer. Cent., i, p. 296.—*Axina* H. and A. Ad., Genera Rec. Moll., ii, p. 193 (in part).—*Euryceratera* (in part) Pfeiffer-Clessin, Noment. Hel. Viv., p. 169.

The section *Oxychona* as here defined, consists of an assemblage of trochoidal Helices inhabiting the mainland of America from Brazil to central Mexico. There is considerable diversity in respect to carination and degree of depression of the spire, just as we find in nearly all groups of Helices (*conf.* Strobila labyrinthica and S. hubbardi; Iberus muralis and I. sicana; Stenotrema spinosa and S. hirsuta, etc.). These differences have caused the species to be distributed by all authors who have heretofore treated of them into numerous exotic groups to which they bear some resemblance. In the Australo-oceanic group *Geotrochus* we have shells extremely similar to Oxychona, and exactly paralleling in the variations in form of its several species the series of forms presented by Oxychona. Thus Geotrochus opalina Sowb. is like Oxychona pileiformis Mor.; G. strabo Brazier is like O. bifasciata Burrow; G. ambrosia Cox, flexilabris Pfr., ramsdeni Angas and many others are very similar to O. trigonostoma Pfr.; while the counterpart of O. guillarmodi Shutt. is seen in numerous species of *Chlorœa* and *Corasia*.

The anatomy is unknown. The shell is rather thin, whitish, with darker spiral bands; the surface is smooth, microscopically spirally striate or granulate; the aperture is like that of Caracolus in lacking teeth. The species are forest-dwellers according to Albers and Morelet.

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Key to species of Oxychona.

I. Shell trochiform, with conical or pyramidal spire, acute periphery, and flattened base; apical whorls convex; last two whorls plane or plano-concave, microscopically spirally striated.

Umbilicus perforated

Narrow, elevated; outer lip not angled nor produced *pileiformis.*

Trochoidal; outer lip angled, expanded rostrated *zhorquinensis.*

Umbilicus closed

Outer lip above carina expanded

Banded; last whorl deflexed, pitted at carina *lonchostoma.*

Unicolored; last whorl scarcely deflexed, not pitted *gyrina.*

Outer lip above carina not expanded *bifasciata.*

II. Shell trochoidal or depressed, with conoidal or depressed spire, carinated or rounded periphery and convex base; sutures moderately impressed; outer whorl convex above, not spirally striated.

Umbilicus open *costaricensis.*

Umbilicus imperforate

Depressed, periphery angular; diam. 27 mill. or more *guillarmodi.*

Conoidal, periphery rounded; diam. 26 mill. or less *trigonostoma.*

H. BIFASCIATA Burrow. Pl. 57, figs. 34, 35, 36, 37.

Imperforate, trochiform, with straight or concave sided conical spire, flattened base and acutely carinated periphery; thin, almost opaque, shining, milky white or a little stained with rosy, unicolored or spirally encircled by dark purplish-brown rather narrow bands, two or one on the upper surface of the last whorl, and one (rarely two) near the outer edge of the base; the bands of upper surface stopping a distance short of the peristome, often reappearing again behind it as two wider brown blotches in line with the bands. The lower whorls are seen to be obsoletely marked with fine spiral impressed lines under a strong lens, and just above and below the carina the whorl has an obsolete malleation, or pitted-crenate character. The spire is elevated, with plano-concave outlines; apex blunt, embryonic whorl smooth, shining, rounded; whorls about 7, the first two quite convex with deeply impressed sutures; the following becoming flatter, separated by linear sutures; last three

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whorls slightly convex above, subconcave at the lower part above the periphery; last whorl very acutely carinated at the periphery, subconcave above and below the carina, not deflexed anteriorly, gently convex beneath. Aperture very oblique, triangular, showing the bands of outer surface within; peristome above the median angle *not at all expanded*, sinuous; basal lip expanded and subreflexed, pink or white, appressed over the umbilicus; terminations of peristome remote; parietal callous scarcely visible.

Alt. 17, diam. 20 mill.; alt. 16, diam. 16½ mill.

Brazil.

Trochus bifasciatus BURROW, Elements of Conchol., p. 188, t. 27, f. 2 (1815); 2d. ed. p. 177 (1825).—*H.* (*Helicigona*) *bifasciata* FER. Prodrome, p. 37.—PFEIFFER in Conchyl. Cab., p. 94, t. 13, f. 1, 2.–*H. pyramidella* WAGNER, in Test. Fluv. Braziliense, p. 22, t. 16, f. 1, 2 (1827).—*Helicina pyramidella* SPIX, MSS. of Test. Brazil.—*Geotrochus pyramidella* BECK, Index, p. 47.—*Helix Bosciana* FER., Prodrome, p. 37; Histoire, t. 64, f. 1.—LAMARCK,, An. s. Vert., ed. DESH., p. 118.—*H. blanchetiana* MORIC. Mém. Gen. vi, p. 2, t. 1, f. 3; vii, p. 418.—*Caracolla bifasciata* GRAY, Ann. of Phil. n. ser. ix, p. 412.—*Helix bifasciata* REEVE, Conch. Icon., f. 574.—PFEIFFER, *Monographia* i, p. 232.—HIDALGO, Mol. Viage al Pacifico, p. 29, t. 1, f. 10, 11.

This species is broader than *H. pileiformis*, with less convex base, and the umbilicus is completely closed. It differs from *H. zhorquinensis* in being smaller, less strictly conical, more concave in the spire, and the peristome above the median angle is not expanded, as it is in that species. *H. bifasciata* is often pure white without bands.

H. LONCHOSTOMA Menke. Pl. 60, figs. 10, 11.

Imperforate, orbiculate-conic, beneath a little convex; acutely carinated; whorls 6, plane, the last trifasciate, and pitted-crenate at the carina, the others so at the sutures; aperture oblique, lanceolate; lip-margins reflexed. (*Menke.*) (Peristome simple, acute, upper margin subexpanded, basal margin narrowly reflexed. *Pfr.*)

Alt. 15, diam. 22 mill.

Brazil, between Rio and Campos.

Caracolla lonchostoma MKE. Synops. meth. Moll., p. 76 (1828).—*H. lonchostoma* PFEIFFER, in Conchyl. Cab., p. 95, t. 13, f. 5, 6.; Symbolæ, iii, no. 567; Monographia i, p. 232.

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I have not seen this species. Pfeiffer says that it is very rare, and that he has seen none besides an excellent specimen in the Menke collection and one presented to him by Menke. The species is readily distinguished from *H. bifasciata* by its depressed form, pitted keel, and the deflection of the last whorl at the aperture. *H. bifasciata* also has a somewhat pitted-crenate malleation of the last whorl, close above and below the central keel.

H. GYRINA Valenciennes. Pl. 57, figs. 26, 27.

Imperforate, elevated-conical, rather thin. subregularly striate, and (under a strong lens) decussated with close spiral striæ, diaphanous, whitish; spire conical, apex acuminate; whorls 6½, nearly flat, the last acutely carinated, scarcely descending anteriorly; base a little convex; aperture very oblique, subquadrangular; peristome a little thickened within, white, the right margin somewhat flexuous, rather widely expanded; basal margin reflexed, columellar margin adnate a short distance.

Alt. 13, diam. maj. 13½, min. 11⅔ mill. (*Pfeiffer.*)

Brazil.

Helix gyrina VAL. (in Paris Mus.), DESH. in Fér., Histoire, t. 63B, f. 4.—PFEIFFER, Monographia iii, p. 180; iv, 204; v, 273.

This, too, is a rare form, which I have not seen. Pfeiffer's description, drawn from a specimen in the Cuming collection, is translated above.

H. PILEIFORMIS Moricand. Pl. 57, fig. 31.

Narrowly perforate, elongated-trochiform, thin, subtranslucent, whitish or olivaceous-brown, obliquely closely striate, and under a lens seen to be spirally finely marked by close impressed lines; spire elevated, pyramidal; *apex blunt;* first two whorls convex, separated by deep sutures, and densely longitudinally *costulate striate;* following whorls less convex, nearly flat, separated by linear sutures; last whorl acutely angulated in the middle, slightly convex beneath, not descending anteriorly; aperture subquadrate, oblique; outer lip somewhat expanded, basal lip expanded; columella straight, vertical, expanded and appressed half around the narrow umbilicus.

Alt. 17, diam. 12½ mill.; alt. 14, diam. 12 mill.

Brazil.

Helix pileiformis MORIC. in Mém. Soc. Genève, vii, p. 420, t. 2, f. 2.—LAMARCK, An. s. Vert., ed. Desh., p. 134.—PFEIFFER, Monographia i, p. 323; Conchyl. Cab., p. 318, t. 55, f. 9, 10.—*Buli-*

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mus pileiformis PFR. Symb., p. 120.—*Geotrochus pileiformis* BECK, Index p. 47.—*H. pileiformis* REEVE, Conch. Icon., f. 589.

May be separated from *H. gyrina* by the pervious umbilicus, not closed by the expanded columellar lip. It is more elevated than the other species of *Oxychona*.

H. ZHORQUINENSIS Angas. Pl. 60, figs. 12.

Narrowly rimate, trochiform, with straight lateral outlines, acutely carinated periphery and nearly flat base; thin, slightly translucent, pale yellowish green, with a narrow, well-defined deep chestnut brown band around the middle of the upper surface of each whorl except the apical two or three, and a very narrow subsutural brown line which continues to the apex and is broader there. The spire is conical, nearly straight-sided; whorls 5½ to 6; the apex is blunt, polished, chestnut and corneous; the first two whorls are glossy, convex, with deep sutures; the remaining whorls are nearly lusterless, and covered with an *extremely minute decussated pattern* of very fine, dense, spiral and oblique impressed lines; lower two whorls plane, with linear sutures; last whorl not descending at aperture, acutely keeled at the periphery; base concave below the keel, then slightly convex in the center; aperture oblique, trigonal, showing the bands inside, expanded; peristome thin, acute, white, expanded all around, especially at the position of the peripheral keel; basal margin briefly reflexed, suddenly widened at the insertion into a little triangular plate which almost covers the narrow umbilicus.

Alt. 21, diam. 25 mill.

Along the Zhorquin River, Costa Rica.

H. (*Oxychona*) *zhorquinensis* ANGAS, Proc. Zool. Soc. Lond. 1879, p. 475, t. 40, f. 1.

"Animal very slender, nearly white, pale brownish on head and top of body." (*Gabb.*)

A species of elegant outline and coloration, allied to *H. bifasciata*, but larger, with finer sculpture, more expanded lip, and pervious umbilicus. The peristome is rostrated or beaked at the position of the peripheral keel; the band of the upper surface stops about 3 mill. short of the edge of the lip, as it does in *H. bifasciata*.

* * *

H. TRIGONOSTOMA Pfeiffer. Pl. 14, figs. 1, 2, 3, 4; pl. 18, figs. 1, 2.

Imperforate, trochoidal, with rounded or bluntly angled periphery and convex base; thin but rather strong, white, spirally banded

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with brown or purplish, marked with irregularly scattered dots which appear translucent by transmitted light; surface rather smooth, shining, with ill-defined oblique striulæ. The spire is short, conoidal; apex obtuse; whorls 4½, convex, separated by moderately impressed sutures, the last sloping above toward the bluntly subangular periphery, slightly deflexed at the aperture. The aperture is quite oblique, rounded-subtrigonal, and shows the bands inside; the lip is white, expanded all around, reflexed and appressed over the umbilicus. Alt. 22, diam. 24 mill.; alt. 17, diam. 24 mill.

Central America; Mexico (?)

H. trigonostoma PFEIFFER, in Philippi, Abbildungen, etc., i, p. 154, t. 4, f. 8 (1844); Proc. Zool. Soc. Lond. 1845, p. 41; Conchyl. Cab., p. 292, t. 49, f. 10; Monographia i, p. 229.—REEVE, Conch. Icon., f. 584 (1852).—CROSSE ET FISCHER, Moll. Mex. et Guat., p. 291, t. 11, f. 6*a*, *b*, *c*, *d*.—(vars. *luteo-albida*, *elevato-conica*, *intermedia*, *subunicolor*, *obscura*) (1878).—*H. salleana* PFEIFFER, Proc. Zool. Soc. Lond., 1849, p. 129; Conchyl. Cab., p. 281, t. 124, f. 17, 18; Monographia iii, p. 173.—REEVE, Conch. Icon., f. 564*a*, *b*.—("*H. lalliana* Pf." TRISTRAM P. Z. S. 1861, p. 230?)

This species is very variable in form, degree of depression and banding. The bands are generally narrow above, broader beneath; the base is generally one or two banded, the periphery surmounted by a band. The more elevated forms have a longer, more straight and subvertical columella. Crosse and Fischer (*loc. cit.*, *supra*) recognize a number of varieties based chiefly on color patterns; judging from the specimens before me, the coloration is not sufficiently stable or constant to admit us to classify the mutations satisfactorily. The form called *H. salleana* by Pfeiffer is thin, globose, more elevated than typical *trigonostoma*. It is figured on plate 18, figs. 1, 2.

H. GUILLARMODI Shuttleworth. Pl. 57, figs. 32, 33.

Imperforate, depressed, about equally convex above and below, keeled at the periphery, thin but rather strong, whitish, encircled by deep brown bands, one just above the periphery, one on the base, and sometimes a third narrow one immediately beneath the suture. Surface rather smooth and shining, striatulate and often indented by little pits; spire convex, depressed, not showing bands; apex blunt; whorls 4 to 4½, the first 1½ or 2 smooth, the remainder striate; sutures linear, scarcely impressed; last whorl convex above

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and below, not descending anteriorly, angulated in the middle; aperture oblique, trigonal, peristome expanded all around, reflexed on the base, and dilated and appressed over the umbilicus and a short distance on the base. Alt. 12, diam. 29 mill.

Cordova (and Vera Cruz?) Mexico.

H. guillarmodi SHUTT. Bern. Mittheil. nos. 248, 249, p. 199. (1852).—Diagn. neuer Moll. no. 2, p. 19 (1852).—PFR. in Conchyl. Cab., p. 413, t. 147, f. 5–7; Monographia iii, p. 206.—*H. guillarmadi* REEVE, Conch. Icon., f. 576.—*H.* (*Corasia*) *guillarmodi* CROSSE ET FISCHER, Moll. Mex. et Gaut., p. 296, t. 10, f. 8.—STREBEL U. PFEIFFER, Beitrag zur Kenntniss mex. L.- u. S.-wasser Conchyl. pt. iv, p. 50 (1880).

The bands continue to the edge of the peristome in *H. guillarmodi*, while in *H. trigonostoma* they stop behind the expansion.

This depressed, lens-shaped species connects the conoidal *H. trigonostoma* with the depressed *H. costaricensis*. It is rather nearly allied to each of these species, but is more depressed than the former, and is not umbilicate like the last-named form.

H. COSTARICENSIS Roth. Pl. 18, figs. 23, 24, 25; pl. 60, figs. 1–9; Vol. IV, pl. 17, figs. 38, 39, 40.

Openly umbilicate, depressed, rather thin, white, banded above with purplish or dark chestnut, base white, rarely banded, umbilicus purplish or chestnut colored inside; surface shining, obliquely finely striated, with traces of spiral sulci above the periphery and on base. Spire depressed; apex obtuse; sutures linear, slightly impressed; whorls 3½ to 4½, moderately convex, rapidly widening, the last bluntly angulated at the periphery, descending anteriorly, convex beneath, at the periphery expanded toward the peristome, on the base constricted just behind it; aperture transverse, oblong or trigonal, very oblique, all the margins of peristome expanded, the basal margin reflexed narrowly, impinging slightly on the umbilicus.

Alt. 12, diam. 30 mill.; alt. 12, diam. 27 mill.; alt. 11, diam. 28 mill.; alt. 10, diam. 24 mill.

Costa Rica.

H. costaricensis ROTH in PFEIFFER, Novitates Conchologicæ i, p. 78, t. 21, f. 15–17; PFEIFFER, Monographia iv, p. 302.—*H.* (*Epiphragmophora*) *costaricensis* TRYON, Manual of Conchology, vol. iv, p. 79, t. 17, f. 38–40.—*H. costaricensis* ANGAS, Proc. Zool. Soc. Lond. 1879, p. 476.—*H. boucardi* ANGAS, Proc. Zool. Soc. Lond.

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1878, p. 72, t. 5, f. 5, 6, 7.—*H. adela* ANGAS, *loc. cit.*, p. 72, t. 5, f. 8, 9, 10.

This is an excessively variable species, allied to *H. guillarmodi*, but conspicuously umbilicated while that form is imperforate. Figures 38, 39, 40, of plate 17 of the Manual vol. iv, are copies of Pfeiffer's original figures of *costaricensis*. Figures 20–22, and 23–25 of plate 18 (this volume) represent Mr. Angas' *adela* and *boucardi* respectively, being copies of his figures. On plate 60 I have figured four specimens selected from the Academy suite collected by GABB and SWIFT. The variation in size and degree of depression of the spire is sufficiently shown by the figures and measurements I have given.

The base is unicolored white in all the specimens I have seen, and the inside of the umbilicus is brown; the spire may be either slightly conical or depressed, and has from one to three bands, either broad or narrow; the umbilical tract is tinged with bright yellow.

"Animal dark gray above, foot white. High hills only." (*Gabb.*) Lives on leaves of trees.

Section IX. ISOMERIA Albers, 1850.

Isomeria ALBERS, Die Heliceen, p. 160 (1850).—ALBERS-MARTENS, Die Heliceen, ed. 2, p. 155 (1860).—H. & A. ADAMS, Genera Rec. Moll. ii, p. 200 (subg. *Lucerna*)—PFEIFFER–CLESSIN, Noment. Hel. Viv., 176 (1878).

A group of large, dark, chestnut or chocolate colored shells, confined to the Andes of Peru, Ecuador and Colombia, allied to Labyrinthus, but with the mouth-parts less developed, the teeth when present generally small. I have seen scarcely half of the species, and although the characters are quite well marked, I have not ventured to construct a "key" to the species. The color of the lip is often variable, species in which it is normally white sometimes having a brown tint on the edge; when it is brown, there is a white spot on its face at the point where the peripheral carina terminates; the back of the peristome is yellowish. Many of the species are oblong, or transversely dilated in outline, seen from above, and this modification is accompanied by a narrowing of the latter third of the last whorl, and an inflation of its base; the peripheral carina is less conspicuous or wholly lost on this portion, in most forms which are so dilated. The parietal wall is generally covered by a thin, transparent callous, which on its edge is thickened, opaque white, forming

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a narrow ridge connecting the ends of the peristome; when there is a tooth on the parietal wall it is small, compressed, and situated well within the aperture. Large enough series have not yet been examined to enable us to be certain of the constancy of several characters upon which specific discriminations are founded, such as the malleation of the last whorl, open or closed umbilicus, etc. The teeth certainly vary in some forms, especially those which may be developed on the upper border of the lip.

H. OREAS Koch. Pl. 45, figs. 11, 12, 17, 18, 19.

Umbilicate, depressed, solid, opaque, deep, rich chestnut brown; surface somewhat shining, obliquely striate, the striæ rather irregular, distant, fold-like beneath the sutures, the base smoother; all over covered by a dense microscopic granulation; scarcely, or not at all malleated; spire depressed; apex very obtuse; first two whorls quite glossy, the following ones duller, more coarsely striate; sutures regularly and moderatelv impressed; whorls 5, slightly convex, regularly, not rapidly widening, the last transversely dilated, subangular at the periphery and rather depressed and compressed on its first two-thirds, the last third losing or nearly losing the angle, tumid and convex beneath, deeply and suddenly deflexed anteriorly, constricted behind the peristome, especially on the base; aperture very oblique, quadrangular, livid within, a trifle exceeding one-half the diameter of shell; peristome white, tinged with brown on the outer-superior portion, reflexed all around, its face convex, the outer portion bearing an acute compressed denticle near its junction with the basal margin; terminations joined across the parietal wall by a narrow elevated white callous; parietal wall bearing a small oblique compressed white denticle; columellar angle of the peristome reflexed partly over the umbilicus; umbilicus rather narrow, deep, scarcely narrowing as it penetrates, somewhat contracted by the first half or two-thirds of the last whorl, then broadly expanding, with a spiral sulcus inside, and generally rugose and obliquely striate within.

Alt. 26, diam. maj. 57, min. 46 mill.

Alt. 23, diam. maj. 55, min. 44 mill.

New Granada.

Helix oreas KOCH in Philippi, Abbild. u. Beschreib. i, p. 151, *Helix* t. 5, f. 2.—PFEIFFER in Conchyl. Cab., p. 55, t. 75, f. 1–3; Monographia i, p. 400.—REEVE, Conch. Icon., f. 546.—MOUSSON in Malak. Bl. 1873, p. 2.—DESHAYES in Fér., Histoire, t. 94, f. 1–4.—

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H. procera PFEIFFER, Proc. Zool. Soc. Lond. 1853, p. 127; Monographia iv, p. 308.—REEVE, Conch. Icon., f. 1273.

There is a variety with thin somewhat fugacious straw colored or buff cuticle, of which a specimen received from BLAND is before me.

The species may be known by its large umbilicus, quadrate aperture with subparallel upper and lower margins, the upper somewhat arcuate, the lower nearly straight. The aperture is nearly as high as wide. The form is generally intermediate between that of figures 12 and 18; it is rarely so elevated as the former.

The *H. procera* Pfr. seems to me to be completely synonymous; it was described from the Cumingian collection. Reeve's figure of it is copied on pl. 48, fig. 43. The dimensions given by Pfeiffer are: alt. 27, diam. maj. 62, min. 49 mill.

It is from the province of Antioquia, Colombia.

H. CONTINUA Pfeiffer. Pl. 46, fig. 27.

Umbilicated, lenticular, carinated, rather solid, striate and subgranulate, brown, strewn with whitish maculations above; spire scarcely elevated, apex fine, obtuse; sutures nearly linear; whorls 5, nearly flat, the last acutely carinated, inflated and deflexed anteriorly, the base tumid, constricted behind the peristome, slightly sulcate inside the umbilicus; aperture very oblique, lunar, with a compressed tooth on the parietal wall; peristome continuous, white, callous, expanded and reflexed, the basal margin very slightly arcuate. (*Pfeiffer.*)

Alt. 15, diam. maj. 41, min. 35 mill.

Province of Ocana, Colombia.

Helix continua PFEIFFER, Proc. Zool. Soc. Lond. 1853, p. 128; Monographia iv, p. 308.—REEVE, Conch. Icon., f. 1270.

H. FAUNUS Philippi. Pl. 46, figs. 21, 22, 23.

Umbilicate, depressed, angulate, striate, subcostulate at the sutures, chestnut colored; spire scarcely elevated; whorls 5, slightly convex, the last subirregular, deflexed at the aperture and rounded, constricted behind the peristome; base inflated; aperture very oblique, semioval, unidentate, livid within; peristome thick, white, reflexed, margins joined by a white callous, the upper margin arcuate, the basal substraightened and separated from the upper by an acute tooth. (*Philippi.*)

Alt. 24, diam. maj. 47, min. 38 mill.

Mts. near Santa Fé de Bogota.

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Helix faunus PHILIPPI, Zeitschrift für Malakozoologie 1851, p. 29.—PFEIFFER, in Conchyl. Cab., p. 416, t. 148, f. 1–3; Monographia iii, p. 257.

Differs from *H. oreas* in the thicker shell, less distinctly granulate, more costulate; the absence of a parietal tooth, and the much thicker lip. (*Phil.*)

I refer to *faunus* as a variety, a pair of shells before me which agree in most respects with Philippi's diagnosis and figures. They may be described as follows:

VAR. RITCHIEANA Pilsbry. Pl. 62, figs. 14–17.

Umbilicate, large, solid, rather thick, deep chocolate colored, carinated at the periphery; surface shining, striate and minutely, densely granulate; spire dome-shaped, low, obtuse; sutures scarcely impressed, except the last half of the outer one, which is impressed; whorls 5½, scarcely convex, gradually widening, the last not so wide as in H. oreas, only slightly dilated transversely, a little narrower on its last third, less carinated there, and more convex beneath; but in all these respects less strongly characterized than H. oreas. Toward the aperture the whorl is rather deeply deflexed, and behind the peristome it is constricted; there is more or less malleation on the last whorl below the periphery, and on one specimen a little above it. The aperture is subquadrate, purplish-brown inside with a satiny sheen, and very oblique; peristome white, reflected, thickened, its face polished and convex, upper margin arched, lower margin thickened, nearly straight, its inner edge slightly undulating or wavy; outer margin with a narrow, slightly compressed tooth; umbilicus 5½ to 6 mill. in diameter, partly covered by the dilated columella; parietal wall with a narrow white callous connecting the terminations of peristome.

Alt. 26, diam. maj. 52, min. 43 mill.

Alt. 21, diam. maj. 51, min. 43 mill.

Aperture, breadth 28, alt. 22 mill. (Inclusive of peristome.)

Pichincha, N.-W. Ecuador.

Named in honor of Mr. JOHN RITCHIE JR., of Boston, Mass. The figures show the variation in elevation to which the species is subject. The aperture has a curved profile like that shown in the figure of *H. Fordiana* on the same plate, but less markedly so.

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H. SUBELLIPTICA Mousson. Pl. 46, figs. 28, 29, 30,

Umbilicated, depressed, thick lens-shaped, striate, not granulate, brownish-corneous; spire convexly-depressed, regular; apex nearly flat; suture impressed-linear. Whorls 4, the first regularly widening, nearly flat, the last whorl obtusely carinated, the circumference elliptical in outline, rather tumid, angulose, briefly descending anteriorly, constricted at the aperture, more swollen beneath, the side of the umbilicus obtusely impressed, obscurely lineated; aperture oblique (50° with axis), obtusely, obliquely rectangular; peristome expanded, reflexed, especially at base, margins connected by a callous thread-like at its outer edge, with a minute compressed denticle within; upper margin curving a little anteriorly, basal margin oblique, nearly straight, sub-thickened, protruding into the umbilicus at the insertion; umbilicus one-seventh the diameter of shell. (*Mouss.*) Alt. 13, diam. maj. 38, min. 23 mill.

Bugua, Amazons.

H. subelliptica MOUSS. in Malak. Blätter, 1869, p. 170.—PFEIFFER, Novit. Conchol. iv, p. 117, t. 127, f. 4–6.

This species belongs to the characteristically South American group *Isomeria*, and is most nearly allied to *H. continua* Pfr. It has, however, no trace of granulation, no whitish spots, no acute keel; its contour is somewhat elliptical, reminding one of *H. erronea* Albers. Moreover, the umbilicus is quite open, and although perfectly adult the parietal tooth is very small and elongated, and does not at all obstruct the aperture. (*Pfr.*)

H. ALOAGANA Jousseaume. Pl. 43, figs. 48, 49.

Shell umbilicate, orbicular, carinated, more convex above than beneath; the shell, although thinner than other species of the same group is still very solid; it is covered with a thin epidermis, very adherent, and granulate, the granulation visible only under a lens; incremental striæ finer, closer, more regular on the base than above, irregular, oblique and always stronger as they approach the suture; color brown, a little lighter on the earlier whorls; the spire is convex, rounded, depressed-conoidal, formed of 4½ whorls, depressed and angular at the periphery, regularly, moderately rapidly increasing; the first two whorls moderately strong and rugose, form a flat reddish apex; the last is irregular, thickened on its latter portion and less carinated, deflexed toward the aperture, constricted behind the peristome; aperture brown inside, very oblique, semioval;

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peristome white, moderately thick; basal margin with two inconspicuous tubercles; columellar margin very short, thicker, partly covering the umbilicus.

Alt. 16 to 17, diam. maj. 35 to 38, diam. min. 30 to 31 mill.

Aperture, breadth 15 to 16, alt. 12 to 13 mill. (Measured inside peristome.)

Canton of Megia, Prov. Pichincha, Ecuador.

Isomeria aloagana Jouss., Bull. Soc. Zool. France, xii, 1887, p. 179.

The above description is somewhat shortened from that of Jousseaume.

H. PERITROPIS Pilsbry. Pl. 63, figs. 10–13.

Umbilicate, rather thin, depressed, lens-shaped carinated at the circumference, convex above and beneath, chestnut colored. The surface is shining, closely obliquely striate, the striæ stronger above, granulate (under a lens), the granulation more or less obsolete, especially on the whorls of the spire. The spire is low-conoidal, its lateral outlines a trifle convex; apex obtuse, corneous, first two whorls minutely granulate, not striate; sutures linear or a trifle impressed. Whorls 5 or 5¼, slowly, regularly widening, nearly plane or a little convex; the last whorl is not oblong nor transversely dilated, but is a trifle narrower toward its latter fourth (seen from above); it is depressed, acutely keeled, somewhat convex beneath; the carina is subobsolete on the last fourth of the whorl. At the aperture the whorl is abruptly deflexed, descending only a short distance (1 to 2 mill.); behind the peristome it is constricted. The aperture is subtrigonal, livid inside. The peristome is expanded, subreflexed, rather narrow and thin, white; the outer portion is labiate with chestnut color inside; outer and upper portions arcuate, basal lip straight, rather abruptly curving at the columellar insertion, where it is a trifle dilated, and connected with the upper margin of peristome by a cord-like white ridge of callous, which is either straight or curves outward a little. There are no lip-teeth; the parietal wall of aperture bears a minute oblique denticle. The umbilicus is large (4 to 5 mill. diam.) and deep; it expands behind the peristome, and has an obsolete spiral furrow there, and stronger radiating striæ.

Alt. 15, diam. maj. 34, min. 30 mill.

Alt. 14, diam. maj. 33, min. 29 mill.

Bogota, Colombia.

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A species which can be compared with *H. aloagana* Jouss., *continua* Pfr., and *subelliptica* Mouss. It is somewhat smaller than aloagana, is not dilated transversely or oblong as that species is (compare the lesser and greater diameters of the two forms), does not have so gradual nor so great a deflexion of the body-whorl at the aperture, is more broadly umbilicated with less dilated columellar lip, and finally, has a small oblique denticle upon the parietal wall, which is lacking in Jousseaume's species. The two specimens figured differ slightly in elevation of the spire; the depressed one is more strongly costulate-striate above than the other shell, and darker colored. *H. subelliptica* Mouss. is smaller, with more rounded periphery and decidedly differently shaped and smaller aperture.

H. FORDIANA Pilsbry. Pl. 62, figs. 18, 19, 20, 21.

Almost covered umbilicate, globose depressed, solid and strong but rather thin, opaque, of a rich chestnut color. The surface is shining, obliquely striate, under a lens seen to be densely, minutely granulate. The spire is very low, regularly convex, about as convex as the base; the two apical whorls are a little lighter colored, and quite convex; the following whorls are almost flat, separated by *sutures scarcely at all impressed.* There are about 4½ whorls; the inner ones widen slowly; *the penultimate becomes rapidly very wide,* its last half being as wide as the adjacent arc of tne last whorl; the body-whorl is somewhat oblong or "transversely dilated," seen from above; it is angled at the periphery, convex beneath, becoming more convex on its last third, and as it approaches the aperture it is *very abruptly and very deeply deflexed, deeply constricted behind the peristome.* The aperture is subhorizontal elliptical-truncate in outline, and is whitish livid inside; the peristome is broadly expanded, subreflexed, very little thickened, its face convex, not flattened, and white or nearly so; the superior border of the lip is convex, wide, stands out from the body-whorl where it joins it, and its plane is more horizontal than the lower lip; it is arcuate, passing in a regular curve into the outer lip, which bears a small rather acute, slightly compressed denticle on its inner edge, below the position of the periphery-termination; the basal lip is straightened (curving into the outer lip), and bears in the middle an obtuse node or tubercle projecting upward; the columellar insertion is dilated, almost closing

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the umbilicus; the ends of the lip are joined by a narrow cord of white callous across the parietal wall.

Alt. 19, diam. maj. 40, min. 34½ mill.

Alt. 18, diam. maj. 38½, min. 32½ mill.

Aperture, breadth, 22½, alt. 17 mill. (Meas. outside peristome.)

Marmato, Colombia.

This species may be known by its thick lens-like form, rapidly widening penultimate whorl, very oblique aperture, deep deflection and constriction of the whorl behind the peristome, etc. The young are acutely keeled, the carina in adults filling the suture; some variation may be expected in the width of the umbilicus, as in other Isomeriæ, and imperforate individuals probably occur, although those before me are not so.

It gives me great pleasure to dedicate this species,—one of the most attractive in its regular, graceful contour of the group *Isomeria*, to JOHN FORD, ESQ., of Philadelphia, a gentlemen whose cabinet and heart are ever open to the needs of fellow conchologists.

H. CALOMORPHA Jonas. Pl. 47, figs. 31, 32.

Imperforate, orbicular, rather thin, convex above, chestnut colored; turgid beneath, whitish; spire obtuse; whorls 6, flat, delicately obliquely striate, the striæ very elegantly granulose; last whorl obtusely angular, the angle encircled by a white band; aperture effuse, subquadrangular; lip chestnut colored, broadly expanded, reflexed, thickened toward the axis, with a white tooth below. (*Jonas.*)

Habitat unknown.

Helix calomorpha JONAS, in Wiegm., Archiv f. Naturg. 1839, p. 341, t. 10, f. 3, 4.—PFEIFFER, Monographia i, p. 315.

Known only by the original description and figures.

H. ÆQUATORIANA Hidalgo. Pl. 47, fig. 39.

Covered subrimate, depressed, orbicular, rather solid, convex above and beneath, all over minutely granulate; purplish-brown; spire little elevated, apex obtuse; whorls 5½, slightly convex, regularly widening, the last subangular at the periphery, deflexed anteriorly, turgid, subcompressed laterally and subconstricted at the aperture; aperture very oblique, quadrangular, pale fuscous inside; peristome broadly expanded, reflexed, slightly thickened, fleshy-fuscous colored, the right margin unidentate; margins connected by a thin callous,

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columellar margin much dilated, appressed, covering the umbilicus. (*Hidalgo.*)

Alt. 34, diam. maj. 71, min. 56 mill.

Ecuador.

H. aequatoriana HIDALGO, Journ. de Conchyl. 1867, p. 307, t. 8, f. 2.—PFR. Monographia v, p. 500.

This species is allied to *H. calomorpha* Jonas and *faunus* Phil. in the *ensemble* of its characters, but is abundantly distinct specifically. The tooth of the aperture is small and acute. It approaches *H. atrata* Pfr., but is distinguished by the larger size; the color brown, not blackish-green, and finally the aperture is quadrangular, not subtrigonal-lunar. Furthermore, the peristome is a fleshy-brown, not white. This last character is rather unimportant, however. (*Hidalgo.*)

H. SCALENA von Martens. Pl. 61, figs. 1–3.

Depressed, obtusely angular, pretty thick, the lines of growth making oblique striæ and where well-preserved granulate, with yellowish-brown periostracum, beneath which it is chestnut-brown; whorls 5, forming a low conical blunt spire; the three uppermost plane and apparently acutely keeled, the keel filling the suture which is therefore plane; the penultimate and last whorls more convex, the suture deeper, bluntly keeled at the periphery, more convex beneath than above; below the keel there is a zone of more or less numerous malleations or indentions. The last whorl widens very decidedly and regularly for its first half; then it becomes narrow, the peripheral angle disappears, and the base more convex, so that what space is lost in the width is made good in the depth of the whorl. Immediately behind the peristome the whorl is narrowed vertically, making a constriction; and this together with the lateral narrowing of the whorl makes the aperture small in proportion to the size of the shell. The aperture has a peculiarly displaced aspect, as if it were compressed in the direction of the smaller diameter; it is very oblique; peristome thickened, narrowly reflexed, reddish-yellow; terminations remote, connected by a distinct parietal callous; upper and outer margins short and arcuate, lower margin long and straight, separated from the outer lip by an angle, widening toward the umbilicus; umbilicus pretty wide, but completely covered by a

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peculiar, flat deposit appressed to the convexity of the base, continued from the callous basal lip. (*Martens.*)

Alt. 29, diam. maj. 55, min. 45 mill.

Aperture, (incl. perist.) diam. 39, alt. 21½ mill.

Aperture, (excl. perist.) diam. 20, alt. 14 mill.

Cerro Pelado, La Plata, New Genada. (2300 *meters' alt.*)

H. (*Isomeria*) *scalena* MARTENS, Conchol. Mittheil. ii, p. 171, t. 31, f. 1–3 (1881–'85).

In lacking teeth this shell resembles somewhat the West Indian *Caracolus.* The umbilicus is closed by the same peculiar callous continuation of the baso-columellar lip described under *H. cymatodes* and seen in various species of *Isomeria.*

H. MEOBAMBENSIS Pfeiffer.

Covered umbilicate, conoid-depressed, solid, subdistantly rugose-striate, all over minutely granulated, cinnamon-colored; spire conoid-convex, obtuse; whorls 5, nearly plane, slowly widening, the last descending anteriorly; periphery subcarinated, above and below more convex; aperture very oblique, tetragonal-lunar; peristome white, reflexed, margins joined by a callous, columellar margin dilated, adnate, straight, unidentate on the right. (*Pfeiffer.*)

Alt. 15, diam. maj. 32, min. 26 mill.

Moyobamba, Peru.

H. meobambensis PFR., Proc. Zool. Soc. Lond. 1856, p. 328; Monographia iv, p. 243.

An unfigured species, known only by Pfeiffer's diagnosis, above translated.

H. ATRATA Pfeiffer. Pl. 44, figs. 3, 4.

Shell nearly covered umbilicate, depressed, solid, striate and minutely granulate, greenish-black; spire a little elevated, apex obtuse; whorls 5, nearly plane, sensibly widening, the last carinated, turgid above anteriorly and deflexed; base swollen, sack-like toward the aperture; aperture very oblique, subtrigonal-lunar; peristome thick, white, reflexed all around, its terminations joined by a thick callous, right margin furnished above the base with an obtuse conical tooth. (*Pfeiffer.*)

Alt. 19, diam. maj. 44, min. 37 mill.

Mts. of Ecuador and Colombia.

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H. atrata PFEIFFER, Proc. Zool. Soc. Lond. 1852, p. 153 (December, 1852!); Monographia iii, p. 258; Conchyl. Cab., p. 366, t. 139, f. 1, 2 (1853).—HIDALGO, Viage al Pacifico, Mol., p. 12 (1870); and in Journ. de Conchyl. 1870, p. 31.—MILLER, Malak. Blät. xxv, p. 167 (1878).—COUSIN, Faune Mal. Répub. de l'Equateur, p. 68, in Bull. Soc. Zool. France, xii, 1887.—JOUSSEAUME, Moll. nouv. de la Répub. de l'Equateur, p. 17, in Bull. Soc. Zool. France, 1887. (Not *H. atrata* Reeve.)

H. atrata Pfr. differs in several respects from the shell figured and described by Reeve under the same name; and the latter form has been separated and re-named as a distinct species by Jousseaume. Reeve's name "atrata" really has priority of publication, bearing date of May, 1852, while Pfeiffer's description was not read before the Zoological Society until December of that year. It is not really necessary to raise this point however. Pfeiffer's "*atrata*" was in MSS. in the Cuming collection before the publication of Reeve's species, for Reeve quotes "Pfr. Proc. Zool. Soc. 1850" giving no page, for there was none because it was not described until 1852. Reeve in his innocent irresponsible way rarely troubled himself to look up a reference or description, and in cases where he did, his struggles and floundering in the slough of synonymy are pitiful to see.

Hidalgo has given a fuller diagnosis than that of Pfeiffer; it is as follows:

Shell nearly covered umbilicate, depressed, solid, shining, delicately striate, and under a lens very minutely granulate; blackish-chestnut, minutely more or less dotted with greenish; spire little elevated, apex obtuse; whorls 5, nearly plane, the last carinated, deeply deflexed at the aperture; base turgid, constricted; aperture very oblique, subrhomboidal; peristome thick, white, reflexed, terminations joined by a thick cord of callous, right margin with an obtuse conical tooth above the base, columellar margin dilated, half covering the umbilicus. Alt. 20, diam. maj. 45, min. 38 mill.

The striæ are well marked beneath the sutures, and some of them are greenish. The form of the umbilicus will separate, at a glance, this species from *H. faunus* Phil., a species very similar in characters. (*Hidalgo.*)

H. MAURITII Jousseaume. Pl. 44, fig. 7.

Narrowly umbilicated, globose-depressed, rather solid, very minutely granulate, obscurely plicate-striate and malleate, blackish-

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chestnut; spire obtuse; whorls 5 to 6, plano-convex, the last subacutely carinated, deflexed and constricted anteriorly; flatly impressed on the base; aperture somewhat squarely ear-shaped; peristome thickened, callous, livid-flesh-color, terminations joined by a callous; basal margin with two small teeth, more or less obsolete. (*Reeve.*)

Puntophaya, Ecuador.

H. atrata REEVE, Conch. Icon., f. 549 May, 1852.—*Isomeria mauritii* JOUSSEAUME, Moll. nouv. de la Répub. de l'Equateur, p. 16 (Bull. Soc. Zool. France 1887).

This form has been commented upon under the last species. It seems to differ from H. atrata Pfr. in being *malleated* and in having *two* lip-teeth. Jousseaume (loc. cit.) gives no new information, having apparently not seen the species which he re-names. Hidalgo, regarding Reeve's *atrata* as a variety of Pfeiffer's shell of the same name, says (Viage al Pacif. p. 13):

"The figure and description of the Conchologia Iconica of Reeve is different from that of Pfeiffer, agreeing with an example in the collection of Sr. Paz, which presents on the last whorl the irregular depressions of *H. cymatodes* Pfr. Another specimen has a small tooth on the superior part of the right lip."

H. CYMATODES Pfeiffer. Pl. 46, figs. 24, 25, 26.

Imperforate, depressed, rather solid, opaque, deep chestnut-colored; surface shining, arcuately striate, especially beneath the sutures, *last 1½ whorls conspicuously indented or malleated above and beneath the periphery,* the entire surface microscopically granulated; spire convex, depressed; apex obtuse; sutures linear, a trifle impressed; whorls nearly 5, a little convex, moderately, regularly widening, the last very slightly dilated transversely, depressed, carinated, the carina extending to the peristome, base tumid on its latter third, deeply indented at the axis, whorl abruptly deflexed and constricted behind the peristome; aperture very oblique, truncate oval, livid inside; peristome reflexed, white, upper margin a little arcuate, outer margin curved, with a small denticle in the middle, basal margin straightened, expanded at its insertion over the umbilicus, connecting with the upper margin by a white parietal callous; parietal wall bearing a small oblique white tooth.

Alt. 24, diam. maj. 51, min. 44 mill. (Specimen.)
Alt. 28, diam. maj. 54, min. 45 mill. (Hidalgo.)
Alt. 22, diam. maj. 52, min. 42 mill. (Pfeiffer.)
Alt. 22, diam. maj. 52, min. 43 mill. (Miller.)

Ecuador.

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H. cymatodes PFR. Monographia, iii, p. 208; Zeitschr. f. Mal. 1852, p. 92.—HIDALGO, Viage al Pacifico, Mol., p. 11, t. 2, f. 1, 2, 3.—MILLER, Malak. Blätter, 1878, p. 169.

This species is dark colored, very strongly indented or malleated above and below the periphery. The lower surface sometimes has a few golden-greenish flecks or irregular obscure maculations in its substance. The reflection of the columellar lip does not wholly cover the umbilicus, but from behind it a thinner membrane-like callous grows, which in fully adult specimens conceals the perforation.

Two smaller specimens of this species before me measure alt. 20, diam. maj. 45, min. 37 mill.; they are decidedly carinated, with $4\frac{1}{2}$ whorls, and the outer superior part of the lip becomes brown. One of these small shells is closely speckled with golden dots beneath.

H. PARIETIDENTATA Miller. Pl. 61, figs. 11–13.

Nearly covered umbilicate, lenticular, solid, acutely carinated, striatulate, very minutely granulate, spirally malleate above and beneath the carina; chestnut, irregularly dotted with whitish and ferruginous; spire very short, convex, apex brownish, obtuse; whorls $4\frac{1}{4}$, nearly flat, the first two punctate, the following striatulate, separated by scarcely impressed sutures; the last turgid on the latter part of the base, abruptly, deeply, angularly deflexed at the aperture, a little constricted beneath; aperture very oblique, retrorse at the carina, rhomboidal; peristome white, right margin above and beneath the carina brownish, at the carina white, expanded and reflexed, margins joined by a thin callous; outer lip with an obsolete tooth below the termination of the carina, another lamellar acute white one in the aperture on the penultimate whorl. (*Miller.*)

Alt. 20, diam. maj. 46, min. 37 mill.

Pilaton Valley, Ecuador.

Isomeria parietidentata MILLER, Malak. Blätter, 1878, p. 169; *l. c.* 1879, t. 5, f. 3a, b, c.—COUSIN, Faune Mal. Rép. Equateur, p. 72.

This species is like H. cymatodes in being malleate above and below the periphery, and in the general appearance. Typical shells differ from cymatodes in being less constricted behind the superior part of the peristome, in having the denticle of the outer lip further below the termination of the carina, and in having a more deflexed whorl at the aperture. The only specimen I have seen is different from the type in being larger, and so densely dotted with

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golden flecks above as to appear marbled; the peristome is narrower than Miller's figures show, and the whorl about as deeply deflexed anteriorly as in H. cymatodes. Alt. 24, diam. 49 mill.

H. KOLBERGI Miller. Pl. 43, figs. 46, 47.

Partly covered-umbilicate, subdepressed, solid, costulate, very minutely granulate at the carina malleate, shining, blackish-chestnut, partly tawny beneath; spire semiglobose, apex rather acute; whorls 5½, convex, acutely carinated, the first two glossy or very delicately granulate, the third striate, the remaining ones irregularly costulate, impressed above the carina, separated by a crenulated suture; last whorl turgid anteriorly, angularly deflexed toward the aperture, one-third of it deeply descending, constricted at the aperture; aperture very oblique, broad, subquadrangular; peristome white, shining, expanded, reflexed, margins connected by a cord of callous, columellar margin dilated, half-covering the umbilicus, forming a right angle with the callous; lip-tooth single, below the termination of the carina. (*Miller.*)

Alt. 26. diam. maj. 53, min. 45 mill.

Valley of Pilaton, Ecuador.

Isomeria kolbergi MILLER, Malak. Bl. 1878, p. 167, t. 8, f. 2.

See remarks under the next species.

H. GRANULATISSIMA Miller. Pl. 43, figs 41, 42.

Umbilicate, lenticular, solid, carinate, striate, delicately, closely granulate or ferruginous-punctate, malleate at the carina, chestnut-colored; spire convex; little elevated, obtuse; whorls 5½, little convex, separated by lightly impressed sutures; first whorls very minutely granulate, following striate, the last rounded anteriorly, suddenly deflexed at the aperture, constricted; aperture very oblique, wide, subquadrangular; peristome pallid, expanded, reflexed, the right margin bidentate, one obsolete tooth above, and another acute one below the carina; basal margin thickened, a little plicate; columellar margin a little dilated, partly covering the pervious umbilicus; terminations of peristome connected by a cord-like callous. (*Miller.*)

Alt. 23, diam. maj. 52, min. 44 mill.

Nanegal, Ecuador.

Isomeria granulatissima MILLER, Malak. Bl. 1878, p. 168, t. 8, f. 3.

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The much more depressed form, lack of rib-striæ, wider umbilicus and superior tooth of the peristome are characters distinguishing this species from the preceding. The deflection of the aperture is very abrupt and short in H. granulatissima, but in H. kolbergi occupies a third of the whorl, descending at first gently, gradually more rapidly. The form of the aperture is similar in both, and both have two or three weak, scarcely noticeable folds on the basal lip. (*Miller.*)

H. MARTINII Bernardi. Pl. 45, fig. 20.

Umbilicate, ovate-depressed, rather solid, obsoletely carinated part way around; epidermis fuscous-brown; very minutely granulate, malleate-striate on the last whorl; whorls 5, subglobose, sutures impressed; last whorl descending; peristome subcontinuous, thick, reflexed, white; aperture transverse, ovoid, brown inside, provided with two teeth, one on the outer lip, one on columella. (*Bernardi.*)

Diam. maj. 32, min. 25 mill.

Quito, Ecuador.

H. martinii BERNARDI, Journ. de Conchyl. 1858, p. 93, t. 1, f. 3; Malak. Bl. 1859, p. 30.—PFEIFFER, Monographia, v, p. 382. (not *H. martini* Pfr., a species of *Ariophanta*)—*H. morula* Hidalgo, Journ. de Conchyl. 1870, p. 32.

The change of name proposed by Hidalgo is unnecessary, as Pfeiffer's "H. martini" belongs to a distinct genus and family. The species is known only by the original description and figure. The type is in the PAZ collection.

H. GEALEI Smith. Pl. 61, figs. 4, 5.

Almost covered rimate, depressed, acutely carinated, rather solid, light chestnut-colored; surface shining, very finely, subobsoletely granulated, obliquely striate, the last whorl a little malleated above and below the peripheral carina; spire low convex-conoidal, apex obtuse, sutures linear, scarcely impressed; whorls 5, apical whorl granulate, following whorls slowly widening, striate, especially below the sutures, subplanulate; last whorl acutely carinated, its last third convex, swollen, base flattened below the carina, then quite convex, narrowly indented around the axis; whorl deeply, very abruptly deflexed at the aperture, constricted behind the peristome; aperture subhorizontal, irregularly quadrate; peristome reflexed in every part, of a bronze-green color, very iridescent, right margin

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sinuous, produced at the place of the peripheral angle and recurved, below this recurved loop there is a strong compressed-conical tooth, tipped with white; basal margin straight, with a blunt tooth and several small subobsolete folds; parietal wall calloused; umbilicus almost completely covered by the expanded columellar insertion of the peristome, which is appressed to the tumid base for a short distance.

Alt. 16, diam. maj. 33, min. 28 mill. (Specimen.)
Alt. 17, diam. maj. 37, min. 30 mill. (Smith.)

Malacatos, South Ecuador.

Helix (*Isomeria*) *Gealei* E. A. SMITH, Proc. Zool. Soc. Lond. 1877, p. 361, t. 39, f. 9.—COUSIN, Bull. Soc. Zool. France 1887, p. 69.

This species is remarkable for its sinuous peristome, *bronze-green in color*, and *very iridescent*. It is allied to the two preceding species. The sinus in the middle of the outer lip is similar to that of some species of the section *Labyrinthus*. Mons. Cousin errs in quoting *Mesembrinus geali* Ad. in the synonymy of this species, and giving the locality "Mexico;" that species being a Mexican *Bulimulus*.

H. STOLTZMANNI Lubomirski. Pl. 57, figs. 28, 29, 30.

Half-covered umbilicate, depressed, solid, striate, striæ oblique, very minutely granulated; color deep chestnut; spire somewhat convex, scarcely elevated; whorls regularly increasing, the last carinated, deflexed anteriorly; base inflated toward the aperture; aperture very oblique, small, axe-shaped; peristome purplish-fulvous, thickened, reflexed, angular at the carina, the terminations connected by a cord-like white callous; there is a single conical denticle below the carina, on the outer lip. (*Lubomirski.*)

Alt. 17, diam. maj. 40, min. 33 mill.

Montana de Palto, Tambillo, Dist. of Chota, Peru.

H. (*Isomeria*) *stoltzmanni*, Prince LADISLAS LUBOMIRSKI in Proc. Zool. Soc. Lond. 1879, p. 720, t. 55, f. 4–6.

The type is in the Museum of Varsovie.

H. ÆQUATORIA Pfeiffer. Pl. 48, figs. 44, 45, 46.

Covered or narrowly umbilicate, depressed, solid, deep chestnut-colored; surface shining, finely striatulate, minutely, subobsoletely granulate, not malleated; spire very low-conoidal, apex obtuse, first two whorls polished; sutures moderately impressed; whorls 5½,

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rather convex, slowly widening, the last angulate at periphery, narrower a little on its last third, the carina becoming obsolete there and the base more convex; gradually, rather deeply deflexed at the aperture, and constricted behind the peristome; aperture very oblique, livid inside, subtrigonal-rounded; peristome liver-brown, reflexed, not nearly so much thickened as in H. juno, upper margin arcuate, with a thickening on its face above the position of the periphery, outer margin bearing a compressed acute tooth a trifle below the position of periphery, basal margin straightened, bearing a square tooth in the middle, its columellar margin expanded over or nearly over the umbilicus and appressed; parietal callous brown, narrow.

Alt. 18, diam. maj. 34, min. 30 mill.
Alt. 18, diam. maj. 31, min. 27 mill.
Alt. 20, diam. maj. 38, min. 32 mill.

Ecuador.

H. æquatoria PFR. Proc. Zool. Soc. 1860, p. 133, t. 50, f. 6; Mal. Blät. 1860, p. 236; Monographia, v, p. 314.—MILLER, Mal. Blät. 1878, p. 170.

Allied to *H. stoltzmanni, equestrata,* and less so to *H. juno.* The upper margin of peristome has a more or less developed callous or swelling on its face, well shown in the figure. The whorls of the spire are convex, as in H. juno.

H. EQUESTRATA Moricand. Pl. 48, figs. 45, 46.

Nearly covered umbilicate, subglobose, solid, striate, very minutely granulate, chestnut-colored; spire little elevated, apex obtuse; sutures impressed; whorls 5, scarcely convex, regularly increasing, the last somewhat carinated, descending; aperture very oblique, tetragonal; peristome thick, white, reflexed, margins joined by a thick callous, provided with an obtuse conical tooth. (*Moric.*)

Alt. 17, diam. maj. 36, min. 31 mill.

Moyobamba, Peru.

H. equestrata MORIC. in Rev. et Mag. Zool. 1858, p. 449, t. 13, f. 1.—PFR. Monographia, v, p. 315.

Known only by the original descripton and figure. It seems closely allied to H. æquatoria, but the lip is white, and the base shows no denticle in the figure.

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H. TRIODONTA d'Orbigny. Pl. 47, figs. 33, 34, 35.

Orbicular-convex, carinate, umbilicate, thick, smooth, reddish-brown; spire short, obtuse; whorls 5; aperture subrotund, peristome tridentate, whitish, brown inside; lip thick, reflexed. (*Orbigny.*)

Umbilicate, conoid-semiglobose, solid, striatulate, chestnut-colored; spire conoid-convex, obtuse; whorls 5½, slightly convex, the last deflexed anteriorly; periphery subacutely carinated, base malleated, inflated around the umbilicus, constricted behind the peristome; aperture very oblique, broadly lunar; peristome white, thickened, reflexed, margins joined by an elevated callous, right margin bidentate inside, basal margin provided with an obtuse tooth in the middle. (*Pfeiffer.*)

Alt. 21, diam. maj. 41, min. 35 mill.

Guayaquil, Colombia.

H. triodonta ORB. Voy. Amér. Mérid., p. 234, t. 24, f. 1–3.—PFR. Monographia, i, p. 407, iv, p. 309.—REEVE, Conch. Icon. f. 1473.

H. JUNO Pfeiffer. Pl. 45, figs. 13, 14.

Imperforate, or sometimes narrowly perforate, depressed, solid, deep chestnut-colored, generally lighter around the axis beneath and with a narrow lighter peripheral band; surface shining, obliquely substriate, very minutely, subobsoletely granulate, obsoletely, more or less obviously obliquely corrugated above; spire short, obtuse; whorls 4½, somewhat convex, separated by moderately impressed sutures, gradually widening, the last whorl wider, slightly oblong or dilated transversely, carinated at the periphery, the keel becoming obsolete on the last third of the whorl, which is tumid beneath, deflexed at the aperture, subconstricted behind the peristome; aperture quite oblique, trapezoidal-lunar, bluish inside; peristome reflexed, *thickened*, flesh-colored, its face convex, terminations connected by a callous; upper and outer margins arcuate, sometimes obsoletely dentate; basal margin widened, with two very blunt heavy teeth or folds near the columellar insertion, dilated over or nearly over the umbilicus and appressed.

Alt. 17, diam. maj. 32, min. 27 mill.

Alt. 18, diam. maj. 35, min. 29 mill.

Alt. 19, diam. maj. 33, min. 29 mill.

Andes of Colombia, Ecuador and Peru.

H. juno PFR Zeitschr. f. Mal. 1850, p. 66; Küster's Conchyl, Cab., p. 304, t. 127, f. 4, 5; Monographia, iii, p. 208.—REEVE,

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Conch. Icon., f. 547.—HIDALGO, Viage al Pacifico, Mol., p. 13, t. 1, f. 6, 7; Journ. de Conchyl. 1870, p. 32.—MILLER, Malak. Blätter. 1878, p. 171.

H. NEOGRANADENSIS Pfeiffer. Pl. 48, figs. 40, 41, 42.

Imperforate, depressed, carinate, thin, minutely granulate all over, deep brown; spire scarcely elevated; whorls 4½, nearly flat, the last convex beneath, deflexed anteriorly, constricted; aperture very oblique, lunate-rounded; peristome flesh-tinted, simple, expanded, a little reflexed, its terminations joined by a thin callous; basal margin very obsoletely uni-dentate, columellar margin short, dilated, appressed. (*Pfr.*)

Alt. 15, diam. maj. 34, min. 28 mill.

Quindiu Mts., Colombia.

H. neogranadensis PFEIFFER, Proc. Zool. Soc. Lond. 1845, p. 64; Monographia, i, p. 296; Conchylien Cabinet, p. 435, t. 151, f. 13, 14.—REEVE, f. 548.—DUNKER, in Jahrbücher d. deutschen Mal. Gesellsch. 1882, p. 379, t. 11, f. 5, 6.

A variety figured by Dunker (pl. 62, figs. 22, 23.) differs somewhat from the type. It lacks a carina; is pretty solid, and the whorls are rugulose above. It is from the mountains of Ecuador.

H. HARTWEGI Pfeiffer. Pl. 45, figs. 15, 16.

Umbilicate, depressed, carinate, solid, striatulate, brown; spire scarcely elevated; whorls 5, planulate, the last a little more convex on the base, not descending anteriorly; umbilicus narrow, pervious; aperture very oblique, irregularly subquadrate; peristome white, thickened, shortly reflexed, margins joined by a callous, right margin sinuous, basal margin nearly straight, dilated, calloused inside, with a single tooth. (*Pfeiffer.*)

Loja, Ecuador.

H. hartwegi PFR., in Proc. Zool. Soc. Lond. 1845, p. 126; Monographia, i, p. 403.—REEVE, Conch. Icon., f. 575.—MILLER, Malak. Blätter 1878, p. 171.—DOHRN, Jahrb. d. Mal. Gesell. 1880, p. 86.—*Isomeria loxensis* MILLER, Malak. Blätter 1879, p. 118, t. 12, f. 1.

Dohrn (loc. cit.) says: *Isomeria loxensis* Miller is equal to *H. hartwegi* Pfr. Of these there lie before me 16 examples, of which 4

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are with open umbilicus, the others having it closed by a thick deposit. The dimensions vary between

a. diam. maj. 29, min. 25, alt. 15 mill., and

b. diam. maj. 24, min. 20, alt. 12 mill.

Miller's *H. loxensis* is figured on pl. 64, fig. 26.

H. BASIDENS Mousson. Pl. 48, figs. 52–54.

Imperforate, very depressed globose, rather solid, transversely striate, especially at the suture, under a lens very minutely granulate, blackish brown. Spire convexo-depressed, regular; apex not prominent; suture lightly impressed, simple; whorls 4½, moderately increasing, the upper ones planulate, carinated, the last angulated, the angle becoming evanescent, anteriorly briefly descending, subinflated and constricted, broadly inflated beneath. Aperture oblique, transversely semioval, grayish-brown inside; peristome reflexed, margins subparallel, not converging, joined by a callous plate, upper and outer margins regularly curved, basal margin thickened, with a somewhat fold-like nodule or tooth and a callous thickening toward the columella; columellar margin short, broadly reflexed and adnate. (*Mousson.*)

Alt. 14, diam. maj. 24, min. 21 mill.

Bogota.

H. basidens MOUSSON in Malak. Blätter 1873, p. 2.—PFEIFFER, Novit. Conch., iv, p. 118, t. 127, f. 7–9; Monographia, vii, p. 362.

This species stands nearest to *H. bituberculata* Pfr., but is separated from that species by numerous characters. It is somewhat larger, is more depressed, the apex not so prominent; it is imperforate, and the whorls are flatter, keeled in the young, finally becoming bluntly angled; on account of the scarcely widened upper margin, the aperture is narrow, and has a single, not very conspicuous tooth or node on the basal lip,—a callous thickening beginning there, and continuing to the columella. Finally, the short columellar-margin is broadly reflected and wholly appressed. In these characters it stands between *H. bituberculata* and *H. neogranadensis.* (*Pfr.*)

H. BITUBERCULATA Pfeiffer. Pl. 47, figs. 36, 37, 38.

Umbilicated, depressed-globose, thin but strong, chestnut-colored or dark chestnut reddish; surface shining, lightly obliquely striate and obsoletely very minutely granulated; spire low, convex, apex obtuse, planulate; sutures moderately impressed; whorls 4, a little convex, slowly widening, the last wider, somewhat oblong or trans-

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versely dilated seen from above or below, convex beneath, and slightly or scarcely at all angled at the periphery; deflexed a short distance to the aperture, scarcely constricted behind the peristome except on the base; aperture quite oblique, truncate-oval, brownish or livid inside; peristome light brown, narrowly reflexed all around, upper and outer margins regularly curved, and developing usually a small node or tubercle where they meet; basal margin straightened, becoming more widely reflexed toward the axis, and bearing inside two tubercles, near to each other; columellar margin dilated, expanded part-way over the umbilicus.

Alt. 12, diam. maj. 22, min. 18½ mill. (Specimen.)
Alt. 12, diam. maj. 19½, min. 16½ mill. (Specimen.)
Alt. 17, diam. maj. 29, min. 23 mill. (Hidalgo.)

Ecuador.

H. bituberculata PFEIFFER, Proc. Zool. Soc. Lond. 1852, p. 153; Küster's Conchyl. Cab., p. 369, t. 139, f. 14, 15; Monographia, iii, p. 242.—HIDALGO, Viage al Pacifico, Mol., p. 14.—*Dentellaria bituberculata* MILLER, Malak. Blätter 1878, p. 165.—*H. bituberculata* DOHRN, Jahrbücher d. Deutschen Malak. Gesell. 1879, p. 186.—*Dentellaria tridentula* KONRAD MILLER in Malak. Blätter 1878, p. 165, t. 7, f. 5.—*Dentellaria latidentata* MILLER, loc. cit., p. 166, t. 8, f. 1.—*Helix bourcieri* REEVE, Conch. Icon., f. 545 (not *bourcieri* Pfeiffer).

This small species is often almost smooth, but generally granules are visible on the whorls under a lens. The two basal tubercular teeth, partly open umbilicus, narrow peristome, etc., separate it from allied forms.

Pfeiffer's description of this species was read under date of December 14, 1852, before the Zoological Society, while Reeve's description was published in May of the same year. In this instance, as that of *H. atrata*, I prefer not to disturb the well-known nomenclature. Pfeiffer's *mss.* names were in the Cumingian collection before Reeve published.

Dr. Dohrn is doubtless correct in uniting the forms described by Miller as *latidentata* and *tridentula* to *bituberculata;* considerable variation in width of the umbilicus and size and development of the lip-teeth is shown in the specimens before me.

Var. TRIDENTULA Miller. Pl. 43, figs. 43, 44, 45.

Imperforate chestnut-colored, sometimes with oblique yellow streaks; right margin of lip with a small tooth; basal margin with

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two equal teeth near the columella; columellar margin dilated, covering the umbilicus. Alt. 14, diam. maj. 28, min. 22 mill. The larger size, wholly covered umbilicus, and tooth on the upper part of the outer lip are the prominent characters of this form, which is very close to the typical *H. bituberculata*. Reeve's "*H. bourcieri*" (pl. 47, fig. 38) is probably this variety.

Var. LATIDENTATA Miller. Pl. 43, figs. 50, 51, 52.

The two baso-columellar teeth are coalescent in this form; the umbilicus is not closed. Alt. 16, diam. maj. 32, min. 24 mill. These mutations are scarcely worth names.

H. BOURCIERI Pfeiffer. Pl. 48, figs. 49–51.

Imperforate, conoidal-semiglobose, rather thin but strong, opaque blackish-brown, *closely painted longitudinally with zigzag, ragged stripes of cream or reddish-cream color.* Surface *showing under a lens an excessively fine, dense, regular granulation,* but *apparently* smooth and polished. The spire is conoidal, very obtuse at apex; the sutures are moderately impressed, smooth, simple. Whorls 4½ to 5, *the apical two corneous,* very convex, *planorboid;* the following whorls less convex; variegated, slowly widening, the last decidedly wider, rounded-subangular at the periphery, *very deeply deflexed toward the aperture;* aperture subhorizontal, truncate oblong, deep purplish and with a satin-like luster inside; peristome white, broadly expanded, outer and basal margins reflexed; upper margin bearing a compressed, acute denticle; outer margin bearing a much smaller one just above its junction with the basal margin, the latter with two small contiguous tubercles in about the middle, sometimes coalescent, the inner one often obsolete or subobsolete; columella expanded and appressed over the umbilicus.

Alt. 15, diam. maj. 25, min. 20½ mill.

Alt. 13, diam. maj. 22, min. 18 mill.

Ecuador.

H. bourcieri PFEIFFER, Proc. Zool. Soc. Lond. 1852, p. 153; Conchyl. Cab., p. 368, t. 130, f. 12, 13; Monographia, iii, p. 209.—HIDALGO, Viage al Pacifico, Mol., p. 15.—*Dentellaria bourcieri* MILLER, in Malakozoologische Blätter 1878, p. 166.—*H. bituberculata* REEVE, Conch. Icon., f. 544.

May be recognized at once by the beautiful color-pattern of zigzag, irregular stripes of a rich cream tint on a dark purplish-brown ground.

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H. SUBCASTANEA Pfeiffer. Pl. 44, figs. 8, 9, 10.

Umbilicate, depressed-orbicular, chestnut-colored, with a narrow whitish or yellowish peripheral fascia; solid; surface lightly, irregularly obliquely striate, microscopically granulated, shining, spire convex; sutures slightly impressed. Whorls 5½, the apical 1½ nearly planorboid, convex, whitish-corneous, the remainder slightly convex, slowly widening, the last angular at the periphery, deflexed anteriorly, deeply constricted on the base behind the peristome, and near the periphery with a deep pit, its sides rugose; aperture very oblique, livid inside; peristome broadly expanded, white, basal margin reflexed, bearing at its junction with the outer margin a large strong, entering, compressed tooth, situated on an eminence of the basal shell-wall causing a pit behind the peristome; basal margin subsinuous within, calloused in the middle, at its insertion half-covering the umbilicus.

Alt. 22, diam. maj. 41, min. 34 mill.

Alt. 23, diam. maj. 44, min. 37 mill.

Alt. 23, diam. maj. 50, min. 43 mill.

S. W. Colombia; N. W. Ecuador.

Carocolla globosa BRODERIP, Proc. Zool. Soc. Lond. 1832, p. 30 (not *H. globosus* Sowerby, Mineral Conchology, ii, p. 157, pl. 170, 1818; see, also, on this species, Edwards, Monogr. Moll. Eocene of England, p. 63, t. 10, f. 2; and Sandberger, Land- u. Süsswasser Conchyl. der Vorwelt, p. 291, t. 17, f. 3).—*H. subcastanea* PFEIFFER, Symbolæ, ii, p. 103; Monographia, i, p. 401.—REEVE, Conch. Icon., f. 543.—*Isomeria subcastanea* MILLER, Malak. Blätter 1878, p. 170.

Known from other species by the single large compressed tooth at junction of outer and basal lips, marked behind the peristome by a deep pit.

The typical form is that figured by Reeve (pl. 44, fig. 10 of this volume); the upper lip is arcuate; a larger, more depressed specimen, with horizontal, subsinuous superior lip is figured on pl. 44, figs. 8, 9.

* * *

The following species form a group intermediate between *Isomeria* and *Labyrinthus* in appearance, differing from the former in having the teeth more strongly developed, especially the parietal fold, and from the latter in the subglobose-depressed form and oblong, transversely dilated outline.

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H. AENIGMA Dohrn. Pl. 39, figs. 93, 94; pl. 44, figs. 1, 2.

Umbilicate, depressed-subglobose, solid, striate, the striation rather coarse just beneath the sutures, fine on base, the whole surface microscopically very densely, regularly granulated; shining, chestnut brown; spire convex, sutures scarcely impressed; whorls 4½ to 5, a little convex, slowly increasing, the last more rapidly widening, carinated at the periphery, transversely dilated, very convex beneath, especially on its last third, where it is less carinated at periphery and much swollen below, deflexed anteriorly, constricted and biscrobiculate behind the peristome; aperture ear-shaped, very oblique, purplish-white inside; peristome light brown, continued as an elevated callous plate across the parietal wall; upper and outer margins of peristome broadly expanded, arcuate, the outer bearing a fold-like tooth just above the place of termination of the periphery, and a strong entering fold extending to the edge of peristome, and marked behind the lip by a pit or scrobiculation; basal lip sinuous, reflexed, in the middle bent upward, forming an obtuse squarish process narrowing the aperture; parietal callous continued in an elevated erect fold entering the aperture; umbilicus rather narrow, partly closed by the inflated last whorl and the inner expansion of the columellar lip.

Alt. 23–25, diam. maj. 45–48, min. 38–39 mill.

Andes of Colombia at Frontino, 2000 meters alt.

H. ænigma DOHRN, Nachrichtsbl. d. Malak. Gesell., 1875, vii, p. 56; Jahrbücher d. Malak. Gesell., ii, 1875, p. 292, t. 10, f. 1, 2; Continuation of Conchylien Cabinet, p. 625, t. 180, f. 1, 2.—PFR. Monographia, vii, p. 591.

H. VEXANS Dohrn. Pl. 44, figs. 5, 6; pl. 42, figs. 38, 39.

Umbilicate, depressed, solid, striate, shining, angulate, chestnut-brown; spire subconvex; whorls 4½, nearly plane, the last angulated, convex beneath, suddenly deflexed at the aperture, coarctate, and bi-scrobiculate on the base; aperture nearly horizontal, rhombic-auriform, ringent; peristome expanded, parietal margin angularly bent in at the middle, and giving rise to a long entering plate or fold; right margin bi-tuberculate; basal margin incurved in the middle and bidentate; columellar margin extending partly over the umbilicus. (*Dohrn.*)

Alt. 12, diam. maj. 28, min. 24 mill.

Canas Gordas, Colombia.

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H. vexans DOHRN, Nachrichtsbl. d. Mal. Gesell., vii, 1875, p. 57; Jahrbücher d. Malak. Gesell., 1875, p. 294, t. 10, f. 3, 4; Continuation of Conchyl. Cab., p. 626, t. 180, f. 3, 4.—PFR., Monographia Hel. Viv., vii, p. 591.

Separated from *H. aenigma* by the lack of granulation, almost horizontal aperture, and the last whorl is not keeled.

Section X. LABYRINTHUS Beck, 1837.

Labyrinthus BECK, Index Molluscorum, etc., p. 33 (Type, "*L. otis*"=*H. labyrinthus* Desh.).—ALBERS, Die Heliceen, p. 121, 1850.—ALBERS–MARTENS, Die Heliceen, ed. 2, p. 154 (1860).—H. & A. ADAMS, Genera Rec. Moll., ii, p. 200 (subg. of *Lucerna*).—KOBELT, Ill. Conchylienbuch, p. 226 (sect. *Lucerna*).—PFEIFFER–CLESSIN, Nomenclator Heliceorum Viventium, p. 174.

Labyrinthus occupies those parts of Northern South America not inhabited by species of *Isomeria*, and generally less elevated country than the mountainous Andean region to which the latter group is confined.

The two groups have much in common; but while in *Isomeria* the teeth are much reduced, sometimes absent or minute, in *Labyrinthus* they are more developed than we find them in any other group of Helices. The lower country of Northern South and Central America will probably be found to be inhabited by some group of snail-eating Carabidæ not found in the Andean region where *Isomeria* lives; and the elaborate labyrinthine lip-armature of *Labyrinthus* has been evolved to protect these snails against their coleopterous enemies.

In *Labyrinthus* there are *three primary folds* or teeth: the *parietal*, an erect entering or oblique lamina, the *outer basal*, usually flattened, compressed, or bifid, and the *inner basal*. These three are present in every known species. As *secondary folds* may be classed the *superior lip-tooth* (of H. bogotensis, otostoma, leucodon, etc.), a conical process, never very large, developed on the inner edge of the upper portion of the lip, the *accessory columellar tooth*, formed by the division of the inner basal tooth (seen in H. dunkeri, bogotensis), and the *superior palatal fold*, a minute, acute fold developed on the upper wall well within the aperture, in H. labyrinthus, plicata, etc. This last is rather inconstant in the species possessing it.

The shell of *Labyrinthus* is not oblong nor transversely dilated, as *Isomeria* usually is; it is not malleated; the surface is microscopically

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granulate; the color is chestnut or brown, sometimes with spiral peripheral and subsutural darker zones.

Key to species of Labyrinthus.

[NOTE.—In using the following Key, the shell should be held with the plane of the aperture at right angles to the line of vision.]

I. OUTER BASAL TOOTH BIFID.

a. Two inner basal teeth.

Diam. over 30 mill.; upper lip with a conical tooth *bogotensis.*

Diam. less than 25 mill.; no tooth on upper lip.

Spire depressed; shell yellowish, banded with darker *dunkeri.*

Spire low-conical; shell unicolored, brown *isodon.*

aa. One inner basal tooth, not bifid.

Upper lip with a conical obtuse tooth *otostoma.*

Upper lip not toothed

Diam. exceeding 30 mill. *bifurcata, furcillata, raimondii, [tarapotonensis.*

Diam. less than 30 mill.

Parietal tooth free from parietal edge of peristome *yatesi, ellipsostoma.*

Parietal tooth arising from parietal edge of peristome *leprieurii.*

II. OUTER BASAL TOOTH NOT BIFID.

a. Outer basal tooth flattened, transverse, entering, or hooked, the parietal tooth pointing directly toward it or toward a point below it on the outer lip.

b. Acutely keeled; lip with 2 teeth below the carina.

Outer basal tooth flat, transverse, broad, nearly meeting parietal *labyrinthus.*

Outer basal tooth smaller, conical or squarish *plicata.*

Outer basal tooth with a projecting acute hook *uncigera.*

bb. Acutely keeled; lip with 3 teeth below carina; parietal callous emarginate *manueli.*

bbb. Obtusely keeled; outer basal tooth deep-seated; parietal callous straight. *triplicata.*

aa. Outer basal tooth a small compressed tubercle on the lip, the parietal tooth directed toward a point above it on the peristome.

Conoidal, thin, light; teeth small; one pit behind lip *tamsiana.*

Depressed, dark; teeth strong; two pits behind lip *leucodon.*

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H. LABYRINTHUS (Chemnitz) Desh. Pl. 39, figs. 87, 88, 89, 90; pl. 64, figs. 14–16.

Umbilicate, depressed, about equally convex above and beneath, acutely keeled at the circumference; strong and solid but not thick, rich chestnut-brown in color; surface shining, lightly obliquely striate, under a lens very minutely granulate; spire convex, low, apex planulate, smooth, whitish; suture scarcely at all impressed; whorls 5, nearly flat, regularly and gradually widening, the last depressed, acutely carinated at the periphery, deflexed anteriorly; the keel on the last third of the whorl is compressed and turned upward, leaving a more or less marked furrow or channel on the corresponding portion of the upper surface; the base is decidedly convex, somewhat tumid, and is deeply, broadly constricted as it nears the aperture, and has two diverging furrows behind the basal lip; the aperture is subhorizontal, ear-shaped, brown inside, obstructed by three principal folds; the peristome continuous, brown, expanded and reflexed in every part; its outer extremity has a recurved sinuosity corresponding to the pinched-up carina of body-whorl; the basal lip is sinuous, and bears two teeth, the outer one is an elevated plate, extending obliquely inward toward the axis, the inner tooth is a stout entering fold; the parietal callous is elevated and recurved; it gives rise to an arcuate lamina entering the aperture and almost meeting the outer tooth of base; there is a small acute lamina on the superior wall of aperture opposite the outer basal tooth; the umbilicus is rather broad (5 to 6 mill.) and deep, partly occupied by the recurved inner angle or loop of the peristome.

Alt. 20, diam. maj. 53, min. 44 mill.

Alt. 18, diam. maj. 49, min. 41 mill.

Alt. 15, diam. maj. 39, min. 31 mill.

Isthmus of Panama; Colombia; Pandma, Ecuador.

Helix labyrinthus (CHEMNITZ, Syst. Conchylien-Cabinet, xi, p. 271, t. 208., f. 2048. 1795) DESHAYES in Guérin's Mag. de Zool., t. 111, f. 1 (1837).—PFEIFFER, in Küster's Conchylien Cabinet, p. 61, t. 2, f. 5; Monographia Hel. Viv., i, p. 397.—*H. labyrinthus* FERUSSAC, Prodr., p. 33; Histoire, t. 54B, f. 5.—REEVE, Conch. Icon., f. 550? —*Carocolla labyrinthus* (in part) An. s. Vert., vi, p. 96.—*Helix otis* of early English collectors; *Labyrinthus otis* BECK, Index, p. 33.—*Lyrostoma labyrintha* SWAINSON, Malacol. p. 329.—*Carocolla subplanata* PETIT, Rev. Zool., 1843, p. 238; Mag. de Zool., 1843, t. 68.—*H. subplanata* DOHRN, Jahrbücher d. Mal. Gesell., 1875, p.

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296.—*H. erecta* MOUSSON, Mal. Blätter, 1873, p. 3.—PFR. Novit. Conch., iv, p. 116, t. 127, f. 1–3; Monographia, vii, p. 461.—DOHRN, as syn. of subplanata *l. c.* supra.—*H. labyrinthus var. sipunculata* FORBES, Proc. Zool. Soc. Lond., 1850, p. 53, t. 9, f. 4.—*H. annulifera* PFR. Proc. Zool. Soc. Lond., 1851, p. 260; Monographia Hel. Viv., iii, p. 255.—REEVE, f. 555.

H. labyrinthus may be distinguished from H. plicata by the greater development of the teeth; the outer basal tooth is broad, flat, plate-like, *and approaches to within one millimeter of the parietal lamina.* The base is more swollen than in H. plicata, more broadly constricted behind the peristome and the inner part of the aperture is narrower. The size is very variable.

Chemnitz is quoted as the authority only by courtesy; his figure is very poor, and his synonymy includes all the figures of the *Labyrinthus* group known to him. Deshayes first rectified the synonymy of this species and *H. plicata.* Dohrn, who declares that he cannot recognize *H. labyrinthus* Chemn. ("Was nun *H. labyrinthus* Chemn. betrifft, so habe ich bereits erklärt, das ich sie nicht kenne und nicht kennen kann," etc.), adopts the name *subplanata* of Petit. That name was not published until six years after Deshayes had redefined and figured *plicata,* and figured what he understood to be the true *labyrinthus.* I am altogether disposed to retain the older name, as there is no question about what shell Deshayes called *labyrinthus.* Dohrn is in error in saying that the mouth-parts and supra-peripheral gutter are always most strongly developed in the smallest specimens; in the series before me these characters are most obvious on several of the largest. Figures 87, 88, 89 of plate 39 are drawn from one of these shells. The other forms included in the synonymy are as follows:

H. erecta Mousson (Pl. 40, figs. 100, 101, 102) is a small form from Bogota, with the outer basal tooth more entering than in typical labyrinthus; the shell is thicker; the color darker; striation stronger, the parietal lamella higher and the basal sinus more developed.

Alt. 13, diam. maj. 30, min. 25 mill.

H. annulifera Pfr. (= *sipunculata* Fbs.) (pl. 42, figs. 32, 33) is smaller than the typical labyrinthus, and white around the periphery. Alt. 13, diam. maj. 34, min. 29 mill. It is from Panama.

A specimen of medium size (alt. 26, diam. 43 mill.) with the peristome less complicated than in the typical form, and the supra-peripheral gutter short and shallow is figured on pl. 64, figs. 14–16.

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This form and the specimen figured on pl. 39, figs. 87–89 are the extremes in aperture development.

Chemnitz writes of *Das Labyrinth* as being extremely rare in his time, and speaks of it as "ein ganz ausnehmendes wundernswürdiges Künststück, welche nicht leichte Jemand ohne Erstaunen ansehen könne." He had not seen a specimen.

All of the specimens before me are from various localities on the Isthmus.

H. PLICATA Born. Pl. 63, figs. 1, 2, 3, 4, 5, 7, 8, 9.

Umbilicate, depressed, about equally convex above and beneath, acutely keeled at the circumference, solid, deep rich chestnut-brown; surface shining, lightly striate, especially below the sutures, under a lens finely densely granulated all over; spire low, convex, apex plane, first whorl polished, first two whorls smooth, light yellowish; sutures scarcely impressed; whorls 5, scarcely convex, moderately increasing, the last wide but becoming narrower on its last third (more or less), abruptly deflexed anteriorly, convex beneath, and constricted behind the peristome, with two short diverging furrows marking the positions of the two basal lip teeth; immediately above the periphery on its last one-fourth, the whorl is concave, forming a shallow gutter, much less pronounced than in typical *H. labyrinthus;* aperture horizontal, ear-shaped, brown inside, obstructed by three teeth; peristome expanded and reflexed all around, continuous, brown or white; the upper margin of lip is toothless, or bears a small compressed acute denticle remote from the margin, opposite the outer basal tooth; the basal lip is sinuous, rather thick, with two teeth within, the outer one either rather square or conical, often crenulated on the tip, never so large or plate-like as that of *H. labyrinthus*, the inner tooth blunt, obtuse; parietal callous elevated, giving rise in the middle to an elevated arcuate lamella entering the aperture; umbilicus rather broad, the inner sinuosity of the peristome entering it.

Alt. 22, diam. maj. 55, min. 47 mill.

Alt. 16, diam. maj. 44, min. 39 mill.

Alt. 17, diam. maj. 36½, min. 34 mill.

Porto Cabello, and Carthagena, Venezuela; Panama.

H. plicata BORN, Test. Mus. Cæs. Vindob., p. 368 (1780).—DESHAYES, Guérin's Mag. de Zool., 1838, t. 110.—PFEIFFER, in Küster's Conchyl. Cab., p. 204, t. 104, f. 1–4; Monographia Hel. Viv., i, p.

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398.—REEVE, Conch. Icon., f. 553.—MARTENS, Binnenmoll. Venezuelas (Ges. Naturf. Fr. Berl., Festschr. 1873.), p. 12.—*Labyrinthus plicatus* SEMPER, Reisen in Arch. Philippinen, Land-mollusken, ii, p. 105, t. 16, f. 9, (anatomy).—*H. labyrinthus var. β* Férussac, Histoire, t. 54B, f. 4.—*Carocolla labyrinthus* (in part) LAMARCK, An. s. Vert., iv, p. 96.—REEVE, Conch. Syst., ii, t. 167, f. 3.—*Carocolla hydiana* LEA, Observations on the genus Unio, etc., ii, p. 98, t. 23, f. 73, 73a.

This species is about the size of *H. labyrinthus*, and like that shell is often more or less pinched into an upward-flaring keel on the last part of the whorl. The parietal tooth is shorter, less sinuous and less deeply entering than in *H. labyrinthus*, and the outer basal tooth (which may be either squarish with crenulated tip, or conical) is much smaller. The following measurements illustrate this difference; the height of the tooth being taken from the outer edge of the peristome directly to the tip of tooth.

H. plicata.

Diam. of shell 48, alt. of outer basal tooth 5 mill.

Diam. of shell 37, alt. of outer basal tooth 4¼ mill.

H. labyrinthus.

Diam. of shell 48, alt. of outer basal tooth 9 mill.

Diam. of shell 37, alt. of outer basal tooth 6½ mill.

There is great variation in size in this species. The small denticle inside the superior lip is frequently absent; this is the case in the specimen figured by Deshayes in Guérin's Magazin, 1838, pl. 110, as the type of *plicata*. This specimen now lies before me. The identity of this species cannot be questioned, as Born refers to Knorr's Vergnügen, figure 5, pl. xxvi, (pt. v), undoubtedly representing the true *plicata*.

Variety. Pl. 63, figs. 7, 8.

This is a form with very thin light shell, the teeth rather slender and long, sinus between the basal teeth very deep, as in *H. labyrinthus;* whorls 4¼, *planulate*, flatter than in H. plicata, and very acutely keeled. Alt. 11, diam. maj. 30, min. 25 mill.

Marmata, New Granada.

H. UNCIGERA Petit. Pl. 42, figs. 23, 25, 25, 26.

Umbilicate, depressed, lens-shaped, acutely carinated, deep chestnut or blackish-brown, with a broad whitish band above and one

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below the periphery; surface obliquely finely striated and very minutely granulated, slightly shining; apical whorl flat, polished, whitish; sutures linear, not impressed; whorls 5, flat, slowly widening, the last acutely keeled, abruptly deflexed anteriorly, concave and constricted behind the peristome near the umbilicus, and with a pit marking the place of the outer basal tooth behind the lip; aperture nearly horizontal, rhomboidal, brown inside showing the bands; peristome reflexed, white or light brown, continued across the parietal wall as an elevated callous; basal margin two toothed; the outer tooth is an entering angular fold which terminates at the edge of the peristome in an acute slender curved projecting hook; inner tooth small, fold-like; parietal lamella elevated, not reaching the elevated parietal callous; umbilicus open, rather broad (4 to 5 mill.).

Alt. 11, diam. maj. 29, min. 25 mill.

Alt. 11, diam. maj. 27, min. 23 mill.

Panama.

Carocolla uncigera PETIT, Guérin's Mag. de Zool., 1838, t. 113.—PFEIFFER, Conchyl. Cab., p. 206, t. 104, f. 8–10; Mon. Hel. Viv., i, p. 398.—REEVE, Conch. Icon., f. 552.—DOHRN, Jahrb. d. Mal. Gesell., ii, 1875, p. 297.

Perfectly distinct in the acute hook-like outer tooth of the basal lip.

VARIETY. Spire more elevated; larger than the type; granulation more pronounced on the last whorl above and below; color clear chestnut brown, without bands, darker behind the white lip. Aperture and teeth typical but the basal margin more deeply arcuate. Alt. 13, diam. maj. 38, min. 35 mill; diam. aperture 19 mill. *Dohrn.*

H. TRIPLICATA Martens. Pl. 41, figs. 17, 18, 19.

Umbilicated, depressed, obtusely angled at the periphery, rather strong and solid but not thick, yellowish-chestnut-colored; surface lightly striate, sometimes subplicatulate beneath the sutures, very densely microscopically granulated all over; spire low, convex or slightly conical; apex planulate, whitish, polished; sutures not impressed or but very slightly so; whorls 5, nearly flat, the last subangular at the circumference, deeply, abruptly deflexed anteriorly, constricted behind the basal lip and 2-grooved there; base convex, generally lightly plicate around the umbilicus; aperture subhorizontal, oblong-ear-shaped, deep purplish-brown inside; peristome flesh-

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colored, continuous, upper and outer margins expanded, the latter bearing at its junction with the base a compressed elevated short entering lamina, rather deep-seated, not extending to the edge of lip by about 2 millimeters; basal lip slightly incurved in the middle, reflexed, bearing a small dentiform fold near its outer part; parietal wall with a slightly sinuous long plate-like entering fold; umbilicus narrow, about 4 mill. wide; superior lip curved downward.

Alt. 12, diam. maj. 25, min. 21 mill.; apert. wide 14, long 8 mill.

Costa Rica.

H. triplicata MARTENS, Malak. Blätter 1868, p. 156.—PFEIFFER, Novitates Conch., iii, p. 460, t. 101, f. 1–3.—*H. œsopus* ANGAS, Proc. Zool. Soc. Lond. 1878, p. 72, t. 5, f. 11, 12; *loc. cit.*, 1879, p. 476.

This shell may be known by the almost rounded periphery, deflexed superior lip of the aperture, outer basal tooth a short high lamella, removed from the edge of peristome. It has a longer parietal lamina than *H. quadridentata, tamsiana* or *leucodon*, and is less carinated; the parietal callous is not incurved in the middle as in H. manueli, and the lower lip is different.

Var. ÆSOPUS Angas. Pl. 64, figs. 27, 28.

Larger, more conical, heavier, with nearly one more whorl, deep purplish-brown above, yellowish beneath with a faintly indicated dark zone; and a dark umbilical patch; whorl less deflexed anteriorly; upper lip less flattened; scrobiculations or grooves behind the basal lip shorter; peristome white, reflexed all around, thickened; lip-teeth brown, parietal lamina white.

Alt. 15, diam. maj. 27, min. 22½ mill.; aperture, width 15, length 11½ mill.

Buena Vista, Costa Rica (3000 *ft. alt.*)

My figures of this form are from specimens collected by GABB. Since writing the above description, I have seen a form intermediate between *triplicata* and *œsopus*, having the deep color of the first, and the form of aperture of the latter variety.

H. MANUELI Higgins. Pl. 42, figs. 27, 28; pl. 55, figs. 15, 16.

Umbilicate, depressed, thin but rather strong, acutely carinated at the periphery, light chestnut-colored; surface lightly obliquely striate and indistinctly, minutely granulated; spire low-conoidal, apex obtuse, apical whorl smooth and whitish, sutures slightly im-

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pressed; whorls 4½ on the specimen before me (5½ according to Higgins), gradually widening, scarcely convex, the last depressed, acutely keeled, very deeply, suddenly deflexed anteriorly, constricted behind the peristome and with two short furrows marking the positions of the basal lip-teeth; aperture very oblique, ear-shaped; peristome continuous, white, broadly expanded, subreflexed, outer portion with a short, entering, compressed tooth, basal margin with two small blunt teeth, the *outer* of which is smaller and marked behind the lip by a short groove; parietal wall traversed by a sinuous elevated callous, giving rise in the middle to an entering, elevated, arcuate lamella; breadth of umbilicus about 3 mill.

Alt. 11, diam. maj. 23½, min. 20 mill. (Specimen.)

Alt. 13, diam. maj. 28, min. 25 mill. (Higgins.)

Macas, Ecuador.

Labyrinthus manueli HIGGINS, Proc. Zool. Soc. Lond. 1872, p. 686, t. 56, f. 5, 5a.—*Helix manoeli* PFEIFFER, Monographia Hel. Viv., vii, p. 462.—"*H. manseli*" PFR.-CLESS. in Noment. Hel. Viv., p. 175.—(?) *H. quadridentata* HIDALGO, Viage al Pacifico, Mol., p. 16, t. 1, f. 8, 9.

This species resembles *H. triplicata* in the long parietal lamella; it differs in being acutely keeled and having a sinuous, not straight, parietal peritreme-edge. From *H. leucodon*, a very closely related form, it differs in the more sinuous parietal lip, longer parietal lamellar tooth, and more convex base; *H. quadridentata* has also a shorter parietal tooth and less sinuous parietal lip than *manueli*. My description and figures 15, 16 on plate 55, are drawn from a specimen before me which differs somewhat from Higgins's description and figures. The latter were drawn by Sowerby, are evidently inexact and so indistinct that my lithographer has in copying them on pl. 42, figs. 27, 28, misinterpreted the forms of the parietal tooth and that on the outer lip opposite to it. The *H. quadridentata* of Hidalgo (pl. 41, figs. 20, 21) seems to be this species.

H. LEUCODON Pfeiffer. Pl. 41, figs. 9–11, 14–16.

Umbilicate depressed, acutely keeled, thin but rather strong, deep blackish-chestnut-colored; surface shining, lightly obliquely striate, covered with minute sharp granules all over; spire low, apex obtuse, apical whorl often a little prominent; sutures a trifle impressed; whorls 5, nearly flat, slowly, gradually widening, the last acutely keeled at periphery, deeply, angularly constricted back of the peri-

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stome, and very abruptly deflexed; base with two pits immediately behind the lip, marking the places of the basal lip-teeth; aperture nearly horizontal, oval-ear-shaped, brown inside; peristome white, expanded, reflexed, continued across the parietal wall in an elevated plate-like callous, its edge somewhat sinuous or concave near its junction with the superior lip; outer lip with a small denticle above (rarely obsolete), a rather large compressed tooth below the carina, and a blunter, rounded, subcompressed tooth on the outer part of the straight basal margin; parietal wall armed with an elevated lamina or tongue-like tooth, arising from the middle of the lip-connecting callous, extending inward obliquely, directed toward a point on the outer lip above the larger outer tooth; umbilicus funnel-shaped.

Alt. 10½, diam. maj. 21½, min 20 mill.

Alt. 9, diam. maj. 21, min. 19 mill.

Venezuela.

H. leucodon PFR. Zeitschr. f. Mal., 1847, p. 81; Conchyl. Cab., p. 271, t. 123, f. 12–14; Monog. Hel. Viv., i, p. 399.—REEVE, Conch. Icon.. f. 558.—MARTENS, Binnenmoll. Venez., p. 13.

Variable in the degree of elevation of spire. Thicker, larger and less elevated than *H. tamsiana* with stronger teeth, darker colored shell and wider umbilicus. I have seen a specimen in which the inner basal tooth is bifid. The surface feels peculiarly rough.

H. QUADRIDENTATA Broderip. Pl. 41, figs. 12, 13.

Shell narrowly umbilicated, depressed-conoidal, rather thin, striate, finely but sharply granulate, opaque, reddish-brown, spire flat-conoidal, with broad, flat apex; suture very superficial; whorls 5½, flat, gradually widening, the last in front somewhat constricted, abruptly deflexed; beneath, at the positions of the teeth deeply furrowed, the base behind this somewhat gibbosely convex; aperture nearly horizontal, oval-ear-shaped, 4-toothed; peristome thin, whitish, expanded, somewhat reflexed, the terminations joined by a straight, low, erect lamina; on the penultimate whorl [parietal wall] stands a tongue-shaped laminar tooth, inside the connecting callous, and not connected with it. The superior margin of the peristome is curved, toothless; on the under lip, near the keel, there is a three-cornered compressed tooth, somewhat curved and erect, and two other blunt teeth, of which the one standing nearest the columella is much smaller. (*Pfeiffer, in Conchyl. Cab.*)

Alt. 9, diam 19 mill.

Central American forests.

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Carocolla quadridentata Brod. Proc. Zool. Soc. Lond., 1832, p. 30. —*H. quadridentata* PFEIFFER, in Küster's Conchyl. Cab., p. 271, t. 123, f. 9–11; Monographia Hel. Viv., i, p. 399.—REEVE, Conch. Icon., f. 557.—Not, in my opinion, *H. quadridentata* HIDALGO, Viage al Pacifico, Mol. p. 16, t. 1, f. 8, 9 (see under *H. manueli* Higgins).

I am not satisfied that any of the several trays before me marked "quadridentata" are really that species. I have therefore given a translation of Pfeiffer's description, which agrees with Broderip's short diagnosis. It seems to differ from *leucodon* in having the parietal tooth *not connected* with the callous joining the terminations of peristome, in this respect evidently nearing *H. tamsiana* Dkr., but differing from this form again, in having a heavier shell, with stronger lip development (teste Reeve).

H. TAMSIANA Dunker. Pl. 41, figs. 5, 6, 7, 8.

Umbilicate, depressed-conoidal, thin, light brown, acutely carinated; surface somewhat shining, lightly obliquely striate, covered with minute prickly granules; spire conoidal, apex blunt, apical whorl prominent, whitish, nearly smooth; suture very superficial; whorls 5, scarcely convex, slowly widening, the last acutely carinated at periphery, very abruptly angularly and strongly constricted behind the aperture and suddenly deflexed; aperture nearly horizontal, ovate-ear-shaped; peristome expanded, subreflexed, white, thin, its terminations joined across the parietal wall by a thin straight elevated white lamina; superior margin of outer lip toothless or with a small denticle in the middle; basal lip with two teeth rather near to each other, the outer one compressed, a trifle entering, its position marked behind the peristome by a slight pit; the inner tooth tubercular, its position not indicated by a pit behind the lip; parietal wall armed with a small compressed oblique white lamellar tooth, directed toward a point on the outer lip above the outer basal tooth.

Alt. 8½, diam. maj. 16, min. 15 mill.

Alt. 7½, diam. maj. 15, min. 14 mill.

Vicinity of Porto Cabello, Venezuela.

H. tamsiana DKR. in Zeitschr. f. Malak. 1847, p. 81.—PFEIFFER, in Conchyl. Cab., p. 466, t. 156, f. 28, 29; Monog. Hel. Viv., i, p. 399.—REEVE, Conch. Icon., f. 556.—MARTENS, Binnen-Moll. Venezuelas, p. 13.

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This smallest species of *Labyrinthus* differs from others which have a simple (not bifid) outer basal tooth, in being thinner, lighter colored, with feebler teeth, the parietal one short, small, *scarcely joined* to the elevated parietal peritreme edge. The superior lip-tooth may be either present or absent, as in *H. leucodon*. The outer basal tooth is marked behind the peristome by a small pit; in the larger, darker, flatter *H. leucodon* both basal teeth are so marked, the outer much more conspicuously.

* * *

2. *Species with the outer basal tooth bifid.*

H. TARAPOTONENSIS Moricand. Pl. 64, figs. 17, 18.

Shell profoundly and broadly umbilicated, sub-lens-shaped, solid, obliquely striate, minutely and irregularly granulate, chestnut-colored; spire obtuse; suture impressed; whorls 5, nearly flat, the last obtusely carinated, deflexed anteriorly; aperture very oblique, ear-shaped; peristome continuous, white, subthickened, parietal margin an erect lamina, right margin rounded, basal margin subangularly descending in the middle, the right side with two teeth, one simple, acute, the other bifid, white. (*Moric.*)

Alt. 12, diam. maj. 34, min. 28 mill.

Tarapoto, Andes of Peru.

H. tarapotonensis MORIC. Rev. et Mag. de Zool. 1858, p. 450, t. 13, f. 2.—PFEIFFER, Monographia Hel. Viv., v, p. 411.

This species belongs to the group of *H. bifurcata;* it resembles *H. furcillata* Hupé, but the constantly very different position and form of the teeth and lamella, and the very different granulation distinguishes it. In the *furcillata* the two teeth are far apart, but supported by a common base; in this species one tooth is simple and conical, nearer the umbilicus than the other extremity of the aperture; the second is double, its base not at all elongated. (*Moric.*)

H. BIFURCATA Deshayes. Pl. 64, figs. 22, 23, 24, 25.

The original figures given by Deshayes are copied on plate 64, figs. 22, 23. Those of Férussac, to which Deshayes refers are on plate 42, figs. 29, 30, 31; and these last differ from the others in having the parietal entering lamina joined to the callous connecting the ends of the peristome. Pfeiffer's description is as follows:

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Shell umbilicate, sub-lens-shaped, solid, arcuately striate and appearing very minutely granulate under a lens, deep chestnut color, more or less acutely carinated, and encircled with whitish at the carina; spire short, convex, obtuse; suture lightly impressed; whorls 5, scarcely convex, the last abruptly deflexed anteriorly; base deeply scrobiculate; aperture very oblique, transversely pyriform, divided by an elongated, free, compressed parietal lamina; peristome white (rarely liver-brown), continuous, the parietal margin erect, partly uncovering the umbilicus, right margin expanded, basal margin sinuous, the left side bearing a subtransverse tooth, right side with two diverging teeth, joined at their bases.

Alt. 14, diam. maj. 36, min 30 mill. (*Pfeiffer.*)

Alt. 12, diam. maj. 38, min. 34 mill. (*Pfeiffer.*)

Alt. 10, diam. maj. 21½, min. 18 mill. (*Pfeiffer.*)

H. bifurcata DESH., in Guérin's Mag. de Zool., 1838, t. 111, f. 2. —PFEIFFER, in Küster's Conchyl. Cab., p. 207, t. 105, f. 1–4; Monog. Hel. Viv., iii, p. 255; iv, p. 305; v, p. 411.—REEVE, Conch. Icon., f. 554.—MARTENS, Binnenmoll Venez., p. 72.—*H. plicata* FER., Histoire, t. 54B, f. 1.—DESH., Encyc. Méth., ii, p. 231. (Excl. synon.)

This seems to be a very variable species, and I am unable to point out the characters separating it from *H. raimondii* and *H. furcillata.* It is sometimes small and only obtusely carinated at the periphery; and the umbilicus is sometimes wholly closed by the expanded columellar lip.

H. bifurcata, tarapotonensis, furcillata and *raimondii* form a group of very closely allied forms, the exact rank, affinities and distinctions of which remain to be ascertained when more numerous specimens are collected and compared. It is at present extremely difficult to separate by any good characters the first three. I doubt whether those drawn from the outer basal tooth are constant.

H. FURCILLATA Hupé. Pl. 39, figs. 91, 92.

Umbilicate, sub-lens-shaped, solid, obliquely striate, under a lens punctate-granulate, chestnut-colored; spire short, obtuse; suture lightly impressed; whorls 5, scarcely convex, the last more convex, obtusely carinated, deflexed anteriorly, broadly bi-scrobiculate on the base; umbilicus moderate, deep; aperture very oblique, transverse pyriform, the parietal wall traversed by a compressed, free callous plate; peristome continuous, white, sub-thickened, parietal margin erect, partly concealing the umbilicus, right margin rounded,

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basal margin subangularly produced downward in the middle, the left part with a strong oblique tooth, the right part with two erect subparallel distant teeth, joined at the base. (*Pfeiffer.*)

Alt. 18, diam. maj. 46, min. 39 mill. (*Pfeiffer.*)

Alt. 15, diam. maj. 44, min. 38 mill. (*Hupé.*)

Huancavelica and Meobamba, Peru.

H. furcillata HUPE, Revue et Mag. de Zool. 1853, p. 302, t. 11, f. 2.—PFEIFFER in Novit. Conch., i, p. 58, t. 17, f. 3, 4 ("*H. erecta*" on plate); Monographia, iv, p. 304.—Hupé, in Castelnau, Exped. Amer. Sud, moll., p. 18, t. 3, f. 1.

Differs from *H. bifurcata* Desh. by the more separated, less diverging branches of the bifid outer basal tooth. *H. raimondii* Phil. is more acutely carinated at the periphery. Figure 91 is very incorrect in not showing the outer branch of the outer basal tooth; fig. 92 is correct.

H. RAIMONDII Philippi. Pl. 40, figs. 91–95.

Umbilicate, lenticular, acutely carinated, thin but rather solid, chestnut-colored, the peripheral region yellowish; surface lightly obliquely striate, under a lens finely granulate; spire low, convex, apex obtuse, apical whorl light colored; sutures scarcely impressed; whorls 5 to 6, nearly flat, slowly widening, the last deflexed anteriorly, constricted behind the lip on the base; aperture nearly horizontal, subrhomboidal, light brown inside; peristome expanded, brown, basal margin reflexed, terminations continued across the parietal wall in a straight elevated plate of callous; basal margin subangular in the middle, bearing a wide outer tooth, with two diverging branches, its position marked behind the lip by a long, deep groove; toward the columellar base there is a narrow, compressed blunt fold; the parietal wall bears an erect, obliquely entering nearly straight lamina, not connected with the parietal peristome-connecting callous; umbilicus deep, wide, rather funnel-shaped.

Alt. 19, diam. maj. 51, min. 45, of umbilicus 8 mill.

Alt. 14, diam. maj. 38, min. 33, of umbilicus 5½ mill.

Peru and Ecuador.

H. raimondii PHIL., Malak. Blätter 1867, p. 65.—PFEIFFER, in Novitates Conchol., iii, t. 79, f. 7–9; Monographia Hel. Viv., v, p. 411.—HIDALGO, Viage al Pacifico, Mol., p. 17, t. 2, f. 4, 5.—*H. tarapotonensis var.?* HIDALGO, Journ. de Conchyl., 1870, p. 38.

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May be known by the depressed, flattened form, acute periphery and diverging branches of the outer basal tooth.

H. YATESI Pfeiffer. Pl. 42, figs 34–37.

Umbilicate, depressed, acutely carinated, thin, chestnut-colored; surface delicately striate, under a lens very minutely granulated all over; spire low-conoidal, apex blunt, suture scarcely impressed; whorls 4½, almost flat, the outer ones wide, last whorl acutely keeled at periphery, tumid on the base around the umbilicus, very deeply abruptly deflexed anteriorly, deeply constricted and bi-scrobiculate behind the basal lip; aperture nearly horizontal, transverse; peristome white, expanded, continuous, thin, basal margin reflexed, sinuous, with two teeth, the outer with two acute diverging branches, the inner a small, narrow, blunt fold; parietal elevated plate connecting the terminations of peristome straight; not connected with the obliquely entering parietal plate-like tooth. Umbilicus variable in width, partly closed by the reflection of the columellar lip.

Alt. 8, diam. maj. 17½, min. 16½ mill.

Alt. 9½, diam. maj. 24, min. 22 mill.

Solimoes River, Brazil.

H. yatesi PFEIFFER, Proc. Zool. Soc. Lond. 1855, p. 92, t. 31, f. 13, 14; Monographia Hel. Viv., iv, p. 306.

The specimens before me are all smaller than Pfeiffer's types (the measurements last given above are from Pfr.). They probably belong to "var. β. minor, fusco-cornea, umbilico paullo angustiore."

H. ELLIPSOSTOMA Pfeiffer. Pl. 41, fig. 22.

Narrowly, half covered umbilicate, conoidal, thin, striate and under a lens very minutely granulate, brown; spire conoidal, subacuminate; suture linear, submarginate; whorls 5, nearly flat, visibly widening, the last acutely carinated, abruptly deflexed anteriorly; base somewhat convex, tri-scrobiculate behind the lip; aperture almost horizontal, elliptical-rhomboidal, with a free lamelliform entering tooth; peristome continuous, white, the parietal margin erect, upper margin narrowly expanded, basal margin reflexed, subangularly descending in the middle, the left side with a single tubercle, right side with two diverging plicæ joined at their bases. (*Pfr.*)

Alt. 9, diam. maj. 20, min. 17½ mill.

Santa Fé de Bogota.

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H. ellipsostoma PFR., Proc. Zool. Soc. Lond. 1854, p. 288; Monographia Hel. Viv., iv, p. 307.—REEVE, Conch. Icon., f. 1389.

Evidently closely allied to *H. yatesi*. I have not seen the species.

H. LEPRIEURII Petit. Pl. 40, figs. 96–99.

Umbilicated, depressed, obtusely angular at the periphery, rather solid; color deep brown, lighter at the keel; surface delicately striate, under a lens seen to be minutely granulate all over; spire low, obtuse at apex; sutures lightly impressed; whorls 4½ to 5, slightly convex, slowly widening, the last obtusely or obviously angular at the periphery, suddenly, deeply deflexed in front, convex beneath, constricted and deeply 2-pitted behind the basal lip; aperture nearly horizontal, ear-shaped; nearly closed by the large teeth; peristome expanded, reflexed, white or fleshy-brown in color, continuous across the parietal wall as an elevated callous-plate, from the middle of which arises a sinuous, deeply entering erect parietal lamina; basal margin sinuous, two-toothed, the outer tooth bifid, situated within the edge of the aperture, the inner tooth on the edge, a very heavy callous deeply entering fold; umbilicus deep, rather narrow.

Alt. 9½, diam. maj. 19, min. 17 mill. (*Specimen.*)
Alt. 10, diam. maj. 18½, min. 16½ mill. (*Specimen.*)
Alt. 11½, diam. maj. 24, min. 21 mill. (*Pfeiffer.*)

French Guiana.

H. Le Prieurii PETIT in Revue Zoologique, 1840, p. 74; *H. leprieurii* PETIT, Mag. de Zool., 1841, t. 32.—PFEIFFER, Monographia Hel. Viv., i, 400.—REEVE, Conch. Icon., f. 560.—*H. auriculina* PETIT, Rev. Zool. 1840, p. 74, and Mag. de Zool., t. 33.—PFEIFFER in Conchyl. Cab., p. 207, t. 105, f. 5–7; Monographia Hel. Viv., i, p. 400.—REEVE, Conch. Icon., f. 562.

This species is quite distinct in the developement of teeth. The parietal lamina arises from the parietal wall of the peristome, is long and sinuous; the inner basal tooth is very heavy and prominent. The form called *auriculina* is more globose and less strongly carinated than typical *leprieurii*.

H. DUNKERI Pfeiffer. Pl. 41, figs. 1, 2, 3, 4.

Umbilicated, depressed, flattened, acutely keeled, quite thin, brownish horn-color, with a peripheral and a subsutural dark chest-

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nut band; surface shining, very delicately striate, under a lens seen to be granulate (more densely than in *H. yatesi*, *leprieuri*, etc.); spire very low, nearly flat, apical two whorls whitish, free from granulation; whorls 4½, nearly flat, the last wide, but becoming narrower behind the aperture, very acutely carinated at the periphery, very deeply, abruptly deflexed in front, constricted and bi-scrobiculate behind the basal lip; aperture nearly horizontal, oval; peristome continuous, thin, expanded; parietal wall bearing a slightly sinuous obliquely entering lamellar tooth; basal lip with a bifid outer tooth, a rather deep rounded central sinus, followed by a narrow fold; between this and the columella there is an elongated fold or tooth, parallel with the lip. All of the teeth are rather deep-seated. Umbilicus broad.

Alt. 8, diam. maj. 19, min. 18 mill.

Alt. 7½, diam. maj. 22, min. 19 mill.

Andes of Colombia.

H. dunkeri PFEIFFER, Proc. Zool. Soc. 1852, p. 157; Monographia Hel. Viv., iii, p. 256.—REEVE, Conch. Icon., f. 559.—PFR. in Conchyl. Cab., p. 365, t. 138, f. 21–23.

May be known by the greatly deflexed aperture, very acute periphery, and four teeth of the basal margin, caused by the splitting of the two normal teeth.

H. ISODON Pfeiffer. Pl. 64, fig. 19–21.

Narrowly umbilicated, conoid-lenticular, solid, all over minutely granulated, chestnut-brown; spire broad-conoidal, obtuse; whorls 5, scarcely convex, slowly widening, the last carinated, very deeply deflexed in front, constricted and scrobiculated; base convex; aperture nearly horizontal, ear-shaped; peristome brownish, somewhat thickened, reflexed, margins joined by an elevated flexuous callous, which gives rise in the middle to an entering tongue-shaped lamina; right margin much curved, bidentate, basal margin sloping, unidentate; teeth subequal, strong, a fourth obsolete one on the columella. (*Pfeiffer.*)

Alt. 10¾, diam. maj. 19, min. 17½ mill.

Western Colombia.

H. isodon PFR., Proc. Zool. Soc. Lond. 1852, p. 84; Conchyl. Cab., p. 490, t. 160, f. 19–21; Monographia, iii, p. 257.—REEVE, f. 965.

Allied to *H. dunkeri*, but unicolored, more elevated, etc.

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H. BOGOTENSIS Pfeiffer. Pl. 42, fig. 40.

Umbilicated, depressed, flattened, not very solid, acutely keeled; color dark chestnut, more or less dotted, especially beneath, with tiny golden flecks; surface somewhat shining, obliquely striate, densely granulate under a lens; spire almost plane, scarcely convex; sutures not impressed, often marginated; whorls 4½, rather rapidly widening, the last depressed, acutely keeled, very deeply, very abruptly deflexed in front, deeply constricted behind the lip, with two deep pits on the base and one above the carina there; base convex; aperture subhorizontal, obstructed by large teeth; peristome continuous, white or flesh-tinted, the parietal margin elevated, emarginate in the middle, and giving rise to a very high erect entering plate-like tooth; basal margin with a large bifid outer tooth, and two blunt tubercular folds toward the columella; upper margin just above the carina produced into a blunt tooth. Umbilicus broad, showing all the whorls.

Alt. 14, diam. maj. 39, min. 35 mill.

Alt. 14, diam. maj. 37, min. 33 mill.

Sante Fé de Bogota.

H. bogotensis PFR., Proc. Zool. Soc. Lond. 1854, p. 288; Monographia Hel. Viv., iv, p. 305.—REEVE, Conch. Icon., f. 1381.

Most closely allied to H. dunkeri, but distinguished at once by its large size.

H. OTOSTOMA Pfeiffer. Pl. 64, fig. 29.

Narrowly umbilicated, sub-lens-shaped, solid, acutely carinated, striate and finely granulate, olive-blackish or chestnut-colored; spire subconoid-convex, obtuse; whorls 5, nearly plane, the last convex, abruptly deflexed in front, profoundly scrobiculated above and beneath the carina; aperture very oblique, subrhomboidal-ear-shaped, ringent; peristome continuous, sinuous on the penultimate whorl, and giving rise in the middle to a long entering lamina; upper margin of peristome with an obtuse conical tooth; basal margin subangularly descending, the left side bearing a strong, subcompressed tooth; the right side a bifurcating one. (*Pfeiffer.*)

Alt. 13, diam. maj. 31, min. 26 mill.

Andes of Colombia.

H. otostoma PFEIFFER, Proc. Zool. Soc. Lond. 1851, p. 260; Monographia, iii, p. 255.—*H. stostoma* REEVE, Conch. Icon., f. 551.

Differs from *H. bogotensis* in having a single, not double, columellar tooth.

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Group XIV. SOLAROPSIS Beck, 1837.

Solaropsis Beck, Index Molluscorum, p. 27 (1837).—Albers, Die Heliceen, p. 127 (1850); 2d ed., p. 164 (1860).—Morch, Cat. Yoldi, p. 8.—H. and A. Ad., Genera Rec. Moll., ii, p. 204.—Pfeiffer–Clessin, Noment. Hel. Viv., p. 185 (1878).—Kobelt, Ill. Conchylienbuch, p. 252.—Fischer, Manuel de Conchyl., p. 470.—*Helicella* Swainson, Malacol., p. 333 (1840).—*Ophidermis* Agassiz, in Charp. Cat. Moll. Suiss. (1837), *teste* Hermannsen, in Indicis Generum Malaco. Prim., ii, p. 153.—*Psadara* Miller, Malak. Blätter, xxv, p. 162 (1878).—*Ophiospila* Ancey, The Conchologists' Exchange, i, p. 64 (1887).

The species of Solaropsis are mostly forest snails, living on the ground under stones and in hollow trees. The species form a series too closely related to admit of the division proposed by Miller, who separated the smaller, thinner forms under the name of *Psadara*. H. rosarium and other species form a connecting link between the depressed forms like H. selenostoma, and those grouping around H. pascalia, feisthameli, etc. Ancey has made a subgenus *Ophiospila* for H. kühni, andicola, etc. This division is, of course, wholly worthless.

The following grouping shows the affinities of the species.

I. Shell large, rather solid, periphery carinated or subangular.

Group of H. serpens.

Granulate above; apex plane, *pellisserpentis, serpens, vipera, monolacca, pellisboæ, anguicula.*

Not granulate; apex sunken at tip, *gibbonsi, præstans.*

Group of H. braziliana.

Granules in more or less distinct oblique rows, *braziliana, heliaca.*

Granulation obscure; peristome dark, *pascalia.*

Densely plicatulate-striate above, *feisthameli, amazonica, napensis.*

II. Shell smaller, thin or fragile, spire low or plane.

Group of H. rosarium (connecting the following group with that of H. braziliana), *rosarium, castelneaudi, kühni, incarum, catenifera, nubeculata, monile.*

Group of H. andicola, *andicola, quadrivittata, diplogonia.*

Group of H. selenostoma, *selenostoma, iris, rugifera, tiloriensis, hians, marmatensis.*

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H. PELLISSERPENTIS Chemnitz. Pl. 50, figs. 74–76, 82–83.

Narrowly umbilicate, depressed, convex, above solid, light brownish with ill-defined narrow streaks following the lines of growth, a series of chestnut arrow-shaped spots below the sutures and a similar narrow one at the periphery; the base generally showing a few rather faint narrow spiral bands, either continuous or broken into spots; surface nearly lusterless, densely granulate (under a lens) except the first 2½ whorls which are smooth and shining, the granulation subobsolete around the umbilicus, where the striæ of growth are stronger; the spire is low-dome-shaped, obtuse; suture lightly impressed; whorls 6, gradually widening, the last obtusely keeled around the circumference, with two deep rugose-striate pits on the side opposite the aperture, one of them on the peripheral carina, the other near it on the base; base broadly concave around the narrow deeply perforating umbilicus. Aperture broad-lunar, purplish with a satin-like luster inside, oblique; peristome white, reflexed all around, the columellar end partly concealing the umbilicus.

Alt. 25, diam. maj. 48, min. 40 mill.

Alt. 22, diam. maj. 40, min. 35 mill.

Guiana; Brazil.

Helix Pellis Serpentis CHEMNITZ, Syst. Conchylien Cabinet, xi, p. 268, t. 208, f. 2046, 2047 (1795), not "*Pellis Serpentis*," etc., l. c. vol. ix, p. 79, t. 125, f. 1095, 1096 (1786).—*Helix pellis-serpentis* FER., Prodr., p. 39; Histoire t. 75A, f. 3.—LAMARCK (in part) An. s. Vert., viii, p. 41.—PFEIFFER in Küster's Conchyl. Cab., p. viii, t. 2, f. 3, 4; Monographia Hel. Viv., i, p. 371; iii, p. 237; iv, p. 285; v, p. 373.—CHENU, Ill. Conchyl., Helix, t. 8, f. 2.—REEVE, Conch. Icon., f. 542.—*Solaropsis pellis-serpentis* BECK, Index, p. 27.—*Helicella pellis-serpentis* SWAINSON, Malacol., p. 333, f. 98.—"*Helix undata*" of early English collectors.—*? ? H. colubrina* PERRY, Conchology, t. 15, f. 4.—*Helix constrictor* HUPE, in Rev. et Mag. Zool., 1853, p. 298.

Separated from all other species of *Solaropsis* by the two deep pits which indent the base and periphery of the body-whorl, much like those of *H. cepa*.

H. SERPENS Martyn. Pl. 58, figs. 38, 39, 40, 41; pl. 59, figs. 50, 51, 52.

This species is similar to H. pellisserpentis in all characters except that it lacks the deep pits on the body-whorl possessed by that form.

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Narrowly umbilicate, depressed, solid, light chestnut-brown more or less streaked longitudinally, with a series of oblique or arrow-shaped chestnut spots beneath the suture and a similar narrower one at the periphery, the base showing a few narrow spiral more or less articulated bands, generally rather obscure. The surface is almost lusterless, substriate, under a lens seen to be covered with a dense granulation (except the inner 2½ whorls which are smooth); this granulation generally nearly obsolete on the base, especially around the umbilicus, where the radiating striæ are much stronger. The spire is low-dome-shaped, obtuse at apex; sutures lightly impressed; whorls nearly 6, regularly, moderately widening, the last rather obtusely but obviously carinated at the periphery, convex beneath, rather broadly concave around the umbilicus, which is of the same width as that of H. pellisserpentis (1¾ to 3½ mill.). The aperture is broadly lunar, oblique, purplish-white inside; peristome reflexed all around, somewhat dilated and impinging on the umbilicus; parietal callous very light and translucent as in H. pellisserpentis.

Alt. 25, diam. maj. 49, min. 46 mill.

Alt. 25, diam. maj. 50, min. 45 mill.

Alt. 23, diam. maj. 52, min. 45 mill.

Guiana; Brazil.

Limax serpens MARTYN, Universal Conchologist, t. 120 (1784). —CHENU, Bibliothèque Conchyliologique, ii, t. 40, f. 3.—*Helix serpens* PFEIFFER, Monographia Hel. Viv., iv, p. 284; v, p. 373.—*H. pellisserpentis var.* FER., Histoire, t. 75 A, f. 2.—PFR., Monog. Hel. Viv., iii, p. 237.—*H. pellis-serpentis* HUPE in Rev. et Mag. de Zool. 1853, p. 296; and in Castelnau's Exped. dans l'Amer. du Sud, Moll., p. 5.—*H. pellis-serpentis var. β integra* DROUET, Essai sur les Moll. Terr. et Fluv. de la Guyane Francaise, p. 51 (1859); and probably, *var. minor* loc. cit., p. 52, t. 4, f. 45.—*Solaropsis serpens* MORCH, Cat. Yoldi, p. 9.

There is considerable variation in the degree of carination of this shell, as will be seen by comparing fig. 39 of pl. 58 with fig. 51 of pl. 59, both drawn from specimens before me. Drouet has described a small form as *var. minor;* it is more distinctly marked by spiral color-spots beneath than any specimens before me, and decidedly smaller (alt. 24, diam. maj. 42 mill.). His figure is copied on pl. 58, fig. 42. This species was very generally confused with *H. pellis-serpentis* by the older authors. The whorls of the spire exhibit part of the peripheral series of spots above the suture, as in

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H. pellisserpentis; this is not the case with the next species, which in other characters seems to be closely allied.

H. PELLISBOÆ Hupé. Pl. 57, figs. 23, 24, 25.

Orbiculate-depressed; the spire obviously convex, obtuse, composed of 6 narrow convex whorls united by a well-marked suture; last whorl nearly rounded; it has a slightly marked angle in the middle, seen from the front; it is very convex and almost smooth, often with growth-striæ on the spire; these striæ are well marked and make the surface a little rugose. The aperture is transverse, half-round; the margins are flexuous and reflexed at the edge in a thick white peristome; umbilicus narrow. The coloration consists of a fawn-colored ground, with a wide descending band at the suture; this band is composed of angular spots alternately brown and white; another band, narrower, but the same in composition, occupies the angle of the last whorl; the base and aperture are fawn color, with several marked traces of darker transverse lines. (*Hupé.*)

This species superficially resembles H. pellisserpentis [*H. serpens* Martyn!], but is distinguished by its more regularly orbicular form, more depressed appearance, narrower whorls of the spire, marked by rugose growth-lines; finally, the base is more convex; the spots are larger. (*Hupé.*)

Alt. 25, diam. maj. 55, min. 48 mill.

Mission of Sarayacu, Peru.

H. pellis-boæ HUPE in Rev. et. Mag. de Zool. 1853, p. 299, t. 9. —*H. boa* HUPE, in Castelnau, Exped. dans l'Amer. du Sud., Moll., p. 6, t. 1, f. 4.—*H. pellis Boæ* PFR. Monographia Hel. Viv., iv, p. 285.

Evidently closely allied to *H. serpens* Martyn; but the whorls of the spire show no trace of the peripheral band, and are rugose-striate.

H. ANGUICULA Hupé. Pl. 54, figs. 24, 25, 26.

Orbicular depressed; spire obtuse, a little convex, formed of 5 narrow convex whorls; the last whorl is rounded, without peripheral angle; all are covered with well-marked transverse striæ. The aperture is large, nearly semilunar, the umbilicus is rounded and pretty wide. The whole shell is fawn-colored beneath; it is ornamented with series of brown spots forming rather numerous concentric lines. The aperture and peristome are white. The upper

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surface probably has wider or narrower bands of angular spots like the allied species, but the bad state of preservation of the individuals at my disposition have this part changed to white, and the color cannot be determined precisely. In the *ensemble* of its characters this species resembles *H. braziliana* Desh., and others of the same group. It is distinguished by the less flat form, the whorls more rounded, notably the last one. The umbilicus is a little more open and the peristome less flexuous than in *braziliana*. (*Hupé.*)

Alt. 18, diam. maj. 37, min. 32 mill.

Mission of Sarayacu, Peru.

H. anguicula HUPE, Rev. et Mag. Zool., 1853, p. 300, t. 10; and in Castelnau's Exped. dans l'Amer. du Sud, Moll., p. 7, t. 1, f. 3.—PFR., Monog. Hel. Viv., iv, p. 286.

Hupe's description is translated above, and his figures copied on pl. 54, figs. 24, 25, 26. Fig. 25 is very poor, like many in the Zoology of Castelnau's Expedition. As Pfeiffer says in his review of this book, "man kann in keiner Haltung des Gehäuses den Wirbel und den Nabeleingang zugleich sehen, so wenig wie beide Böden eines Fasses auf der bekannten Hogarthschen Carricatur."

I refer to this species the specimen figured on pl. 64, figs. 30, 31 32. It is smaller and less carinated than H. serpens, flatter above; whorls 5; the granulation is quite obscure.

Alt. 18, diam. maj. 38, of umbilicus 3 mill.

H. VIPERA Pfeiffer. Pl. 50, figs. 77, 78.

Very narrowly umbilicated, depressed, rather solid, irregularly striate above and densely granulate, pale reddish, with two bands formed of angular spots of alternate white and reddish, one at the suture the other above the periphery, the space between them streaked with reddish; spire convex, obtuse; whorls 5, slightly convex, the last subcarinated, with a furrow on the periphery opposite the aperture, not descending anteriorly, beneath irregularly tumid and impressed, radiately striate, painted with bands of bead-like spots; aperture diagonal, subtriangular lunar; peristome white, the margins remote, upper margin expanded, basal thickened, subreflexed, half covering the umbilicus by its dilation. (*Pfr.*)

Alt. 18, diam. maj. 37, min. 31 mill.

Brazil.

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H. vipera Pfr. in Proc. Zool. Soc. Lond. 1859, p. 27, t. 44, f. 6; Malak. Blat. 1859, p. 29; Novit. Conch., ii, p. 149, t. 38, f. 12–14; Monog. Hel. Viv., v, p. 373.

Has a smaller aperture than the allied species.

H. monolacca Pfeiffer. Pl. 51, figs. 90, 91.

Half-covered umbilicate, conoid-depressed, rather solid, striate and granulate; tawny, with close radiating reddish streaks, a trifle undulating; spire conoid-convex; apex obtuse; whorls 5½, a little convex, sensibly widening, the last not descending, at the periphery subangulated; on the side opposite the aperture inflated above, and markedly a lightly impressed scar or cicatrix; base regularly excavated, indistinctly fasciate; aperture diagonal, subtriangular-lunar; peristome white, margins joined by a thin shining callous, the right one slightly expanded, basal thickened, reflexed, broadly dilated over the umbilicus, nearly closing it. (*Pfeiffer.*)

Alt. 21, diam. maj. 46, min. 39 mill.

Surinam.

H. monolacca Pfr. in Malak. Blätter, iv, 1857, p. 155; Novit. Conch., ii, p. 147, t. 38, f. 1, 2, 10, 11; Monographia Hel. Viv., iv, p. 285.

Described from a single example in Pfeiffer's collection.

H. gibboni Pfeiffer. Pl. 51, figs. 84, 85, 86.

Umbilicate, depressed, obtusely carinated, solid, light yellowish, but so densely streaked and spotted with reddish-chestnut that the ground-color is nearly covered except around the umbilicus. There is a subsutural series of angular alternating reddish-chestnut and whitish spots; a narrower one above the yellowish periphery, and several similar ones below it; the base, inside of these, has numerous concentric articulated lines and narrow bands, even into the umbilicus; the spaces between the bands are densely streaked and clouded with reddish-chestnut, except around the umbilicus where it is lighter. The surface is coarsely, obliquely striate above, less so beneath, not granulate. The spire is convex, very obtuse, *apex a trifle sunken*, apical two whorls unicolored, pale reddish, finely striate, whorls 5, slightly convex, moderately, regularly widening, the last obtusely angular at the periphery, convex beneath. Aperture broad-lunar, oblique, bluish or lilac with a satin-like luster inside; peri-

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stome reflexed all around, thickened on the base, dilated half over the umbilicus; parietal callous transparent, thin.

Alt. 28, diam. maj. 60, min. 51 mill.; umbilicus 3½ mill.

Alt. 27, diam. maj. 63, min. 54 mill.

Marmato, etc., New Grenada.

H. gibboni PFR. Symbolæ, iii, p. 37; Küster's Conchyl. Cab., p. 213, t. 107, f. 10; Mon. Hel. Viv., i, p. 374.—BLAND, in Adam's Contrib. to Conch., p. 231.—REEVE, Conch. Icon., f. 539.—*H. magnifica* LEA, Obs. gen. Unio, etc., ii, p. 89, t. 23, f. 88 (not *magnifica* Fér.).—*H. amori* HIDALGO in Journ. de Conchyl., 1867, p. 71, t. 1, f. 3; Viage al Pacifico, Mol., p. 7, t. 1, f. 1–3.—DOHRN, Jahrb. d. Mal. Gesell., ii, p. 298.—MOUSSON, Malak. Blät. 1873, xxi, p. 2.—*Solaropsis amori* COUSIN, Faune Mal. de la Rep. de l'Equateur, p. 67.

This shell differs from all the preceding in being striate but *not granulate.* The tip of the apex is slightly sunken; and the color-pattern is more elaborate generally than the other species, though sometimes it is decidedly obscure and mottled as in the specimen figured in fig. 86. The spire is often less obtuse than the specimens shown in my figures. The *H. amori* of Hidalgo is merely a variety as Dohrn has already pointed out.

Var. AMORI Hidalgo. Pl. 52, figs. 94, 95.

Larger, with more numerous spiral series of spots below the periphery; often becoming confluent into zigzag streaks there.

Alt. 30, diam. maj. 79, min. 63 mill.; umbilicus 6 mill.

Alt. 40, diam. maj. 83, min. 63 mill. umbilicus 6 mill.

Tena and Archidona, Ecuador.

The last locality is that of a magnificent specimen in the collection of Mr. John Ford of Philadelphia. This is the largest and handsomest species of Solaropsis.

The following is probably a color-variety of *H. gibboni.*

Var. COUSINI Jousseaume. *Unfigured.*

Large, umbilicate, rather solid, depressed, sublenticular, regularly striate; first 2 whorls flat, uniform yellowish; following whorls painted with spiral bands of red and white flames. This form is the same size as *H. amori;* the spire is less depressed; whorls less depressed; aperture larger; coloration above consists of pretty wide,

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sinuous, oblique brownish-chestnut flammules, separated by whitish-yellow spaces; base 2-banded.

Alt. 45, diam. maj. 85, min. 70 mill.

Napo Basin, Ecuador.

Solaropsis cousini Jouss., Bull. Soc. Zool. France, xiii, p. 177, 1887.—Cousin, Faune Mal. Rép. Equateur, p. 67 (Bull. Soc. Zool. France, xiii, 1887).

H. præstans Pfeiffer. Pl. 53, fig. 16.

Nearly covered perforate, globose depressed, rather thin, striatulate, chestnut-colored above, ornamented with buff flammules, base buff, irregularly banded with chestnut, covered with a slightly shining epidermis; spire short, obtuse; whorls 4½, slightly convex, the last inflated, scarcely descending anteriorly; aperture oblique, rounded-lunar, pearly within; peristome livid, briefly expanded and reflexed, the margins scarcely converging, joined by a callous, the columellar dilated. (*Pfr.*)

Alt. 26, diam. maj. 53, min 42 mill.

Province of Ocana, New Grenada.

H. præstans Pfr., Proc. Zool. Soc. Lond. 1853, p. 126; Monog. Hel. Viv., iv, p. 212.—Reeve, Conch. Icon., f. 1276.—Dohrn, Jahrbücher d. Mal. Gesell., ii, p. 298.

H. braziliana Deshayes. Pl. 53, figs. 14, 15.

Umbilicate, depressed, thin but rather solid, chestnut-colored above, with a subsutural and a supra-peripheral band of alternating dark chestnut and whitish angular spots; below the periphery light yellowish-chestnut with numerous spiral articulated lines and narrow bands; surface densely very regularly granulate all over (except the apical whorls), the granules equidistant, arranged (more or less obviously) into oblique rows. The spire is depressed, only a trifle convex; apex obtuse; sutures impressed; whorls about 5, regularly widening, slightly convex, the last depressed, obsoletely angular at the periphery, which is decidedly above the middle of the whorl; base very convex. Aperture oblong-lunar, slightly oblique, delicate lilac-colored inside; peristome all around narrowly expanded and subreflexed, white, its upper, outer and columellar

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margins all decidedly very regularly arcuate, the basal margin regularly curved.

Alt. 19, diam. maj. 42, min. 34. mill.; umbil. 3 mill.

Alt. 18, diam. maj. 39, min. 33 mill.; umbil. 2½ mill.

Alt. 17, diam. maj. 33, min. 27 mill.

Brazil.

H. braziliana DESH. Encyc. Méth., ii, p. 211.—PFEIFFER, in Conchyl. Cab., p. 211, t. 107, f. 1–3; Mon. Hel. Viv., i, p. 372. REEVE, Conch. Icon., f. 536.—HIDALGO, Viage al Pacifico, Moll., p. 9.—HUPE in Castelnau, Exped. dans l'Amér. du Sud., Moll., p. 8, t. 2, f. 2.—*H. pellis-serpentis var.* FER., Histoire, t. 75 B, f. 6–8.—*H. serpens* ORB., Voy. dans l'Amér. Mérid., p. 244.

I have never seen a specimen with hirsute cuticle as it is figured by Ferussac. The numerous specimens before me show but slight variation except in size. The spiral bands of chestnut-colored spots are more numerous than in other species, especially on the base.

H. HELIACA d'Orbigny. Pl. 53, figs. 4, 5, 6, 7.

Orbicular, depressed, umbilicate, subcarinate, thin, translucent, fragile; the surface above is shagreened at the summit, but the two last whorls of the spire are sculptured by elevated oblique, interrupted and zigzag ridges, which cover most of the surface; the tract around the umbilicus is entirely smooth. The spire is obviously elevated, composed of 6 whorls, a little carinated; umbilicus narrow, partly concealed by the lip; aperture very oblique, broader than high; peristome wide, broadly reflexed, sinuous at the columella. Color yellowish fawn ornamented with 3 spiral series of spots above, 2 below; two of the bands above are composed of transverse elongated interrupted fawn-colored blotches; the third is median and linear; beneath, the outer band is composed of broad transverse spots, which unite with a second one, composed of elongated interrupted spots. Peristome white. (*Orb.*)

Alt. 16, diam. 37 mill.; alt. 12, diam. 28 mill.

Bolivia and Argentine Republic.

H. heliaca ORB. Voy. dans l'Amér. Mérid. Moll., p. 244, t. 26, f. 1–5.—PFR. in Conchyl. Cab., p. 211, t. 107, f. 4–6; Monographia Hel. Viv., i, p. 372.—REEVE, Conch. Icon., f. 538.—HUPE, Casteln. Exped. dans l'Amér. du Sud. Moll., p. 10, t. 2, f. 1.—*H. cicatricosa* ANTON, Verzeich., p. 38 (*teste Pfr.*).

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H. PASCALIA Cailliaud. Pl. 54, figs. 17, 18, 19, 20.

Umbilicate, depressed, rather solid, light chestnut-brown, with several narrow bands composed of arrow-shaped chestnut spots above, several lines of similar composition beneath; one band is immediately above the peripheral carina, and sometimes all others on the superior surface are obsolete; there are usually a few irregular short dark streaks below the suture, well shown in figure 18. The surface lightly substriate and densely granulate; but the granules are not at all arranged into patterns or lines; the spire is low-conoidal, obtuse; whorls 5, regularly widening, the last carinated around the middle, convex beneath. Aperture oblong-lunar, bluish-lilac inside, slightly oblique; peristome narrowly expanded and reflexed, *dark purplish-brown*, outer margin well curved, basal straighter, columellar margin arcuate, dilated partly over the umbilicus.

Alt. 17, diam. maj. 40, min. 35½ mill.; of umbil. 3 mill.

Alt. 16, diam. maj. 37, min. 31 mill.; of umbil. 2½ mill.

Brazil.

H. pascalia CAILL. in Journ. de Conchyl. 1857, p. 102, t. 2, f. 3. —PFEIFFER, Mon. Hel. Viv., iv, p. 350.—DOHRN in Jahrb. d. Mal. Gesell. 1882, p. 102.—*H. amazonica* HUPE, in Casteln., Exped. dans l'Amér. du Sud Moll., p. 9, t. 1, f. 1 (not *amazonica* Pfeiffer).

This species may be known by the dense granulation, the granules not arranged in lines nor coalescent into folds, the pallid coloration, nearly obsolete spiral bands, and the dark purplish-brown peristome. A very pale whitish, translucent color-variety before me is figured (figs. 19, 20). Hupe's figures of this species which he calls "*H. amazonica*," are given on pl. 59, figs. 58, 59.

H. AMAZONICA Pfeiffer. Pl. 59, fig. 60.

Umbilicate, depressed, solid, closely undulate-plicate above and subgranulate, spotted with red at sutures and carina; spire scarcely elevated, obtuse; whorls 5½, a little convex, regularly widening, the last not descending, subacutely carinated at the periphery; the base inflated, closely radiately striate, yellowish-white, multi-fasciate with red; umbilicus narrow, pervious; aperture a little oblique, angulate-lunar, margaritaceus inside; peristome narrowly reflexed, the superior margin nearly horizontal, basal margin arcuate, columellar margin expanded into a triangular plate. (*Pfr.*)

Alt. 23, diam. maj. 53, min. 41 mill.

Along the Amazon River.

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H. amazonica PFR. Proc. Zool. Soc. Lond. 1854, p. 286; Monographia Hel. Viv., iv, p. 299.—REEVE, Conch. Icon., f. 1386.—DOHRN, Jahrb. d. Mal. Gesell. 1882, p. 102.

A rare species of which a single imperfect specimen is before me. Described from a specimen in the Cumingian collection. By error, the figure is connected by lines on my plate with *H. pascalia.*

H. FEISTHAMELI Hupé. Pl. 60, figs. 16–18; pl. 58, figs. 46–48; pl. 53, figs. 8–10.

Umbilicate, depressed, carinated, thin, light brown, paler beneath, with a series of short inconspicuous reddish spots below the suture and another immediately above the periphery; the space between these rows either unicolored or obscurely obliquely streaked with tawny; immediately below the peripheral angle there is a continuous reddish line, as in H. amazonica, but much narrower; and the rest of the base is encircled by few or many articulated reddish lines, some of them sometimes almost continuous; and there is usually a wider fascia within the umbilicus. The surface is shining, and all over densely obliquely strongly striate; the striæ under a lens appearing as sharply cut undulating, frequently anastomosing little folds. The spire is low, blunt at apex. Whorls 5 (apical two smooth); regularly, gradually widening, only slightly convex, the last with an acute white carina, convex beneath; aperture slightly oblique, lunar, whitish tinged with lilac inside, and faintly showing the peripheral fascia, peristome very narrowly expanded, basal margin subreflexed, subsinuous, columellar margin expanded in a triangular plate slightly impinging upon the umbilicus. Parietal callous scarcely perceptible.

Alt. 17, diam. maj. 35, min. 31 mill.; umbilicus 3 mill.

Alt. 15, diam. maj. 35, min. 29½ mill.; umbilicus 4 mill.

Brazil.

H. feisthameli HUPE, Rev. et Mag. de Zool. 1853, p. 302, t. 11, f. 1.—PFEIFFER Monographia Hel. Viv., iv, p. 302.—*Solarium serpens* SPIX, Test. Braziliense, t. xvii, f. 2.—*Helix serpens* PFR., Symbolæ ii, p. 100; Monographia, i, p. 391; Küster's Conchyl. Cab., p. 213, t. 107, f. 7–9.—REEVE, Conch Icon., f. 537.—HUPE in Casteln., Exped. Amér. du Sud, Moll., p. 8, t. 1, f. 2 (not *H. serpens* Martyn).—*H. punctata* WAGNER in SPIX, p. 23, t. 17, f. 2 (not *H. punctata* Müll.).—*H. pellis-serpentis var.*, FER., Histoire, t. 74, f. 2.—(*Solaropsis Moricandi* Ads., Genera, p. 205?)

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The principal mutation to which this species is subject is in coloration; the red spots being sometimes almost completely obsolete above; a close inspection will reveal traces of them beneath the suture, however. The peculiar surface sculpture described above is very characteristic. There is a form which is almost always very pale, even whitish in color, the tawny markings reduced or subobsolete, the spire scarcely at all elevated. It may be called var. PLANIOR. Figures 8–10, pl. 53, represent this form. This is not an uncommon shell in collections.

H. NAPENSIS Crosse. Pl. 51, figs. 87, 88, 89.

Broadly umbilicate, depressed, planate, rather thin, above with strong, rugose, submalleated, oblique, rather distant striæ; pale fulvous, with two bands of alternating red and white spots, a wide one below the suture, and another above the periphery; spire planate, obtuse; apex scarcely prominent; suture deeply impressed; whorls 5, nearly flat, the first 1½ smooth, pale fulvous, the last scarcely descending, acutely carinated, convex below, encircled by an obscure series of reddish spots, obliquely roughly striate, obtusely subangular around the umbilicus, and destitute of striæ; aperture oblique, ovate-lunar, whitish inside; peristome white, margins remote, the columellar subdilated, narrowly reflexed, somewhat attenuated outwardly. (*Crosse.*) Alt. 14, diam. maj. 32, min. 27 mill.

Between Quito and Napo, Ecuador.

H. napensis CROSSE, Journ. de Conchyl. 1871, p. 228, 414, t. 13, f. 1.

H. ROSARIUM Pfeiffer. Pl. 60, figs. 13–15; pl. 61, figs. 6–10.

Umbilicate, depressed, thin, subtranslucent, light corneous brown, with a series of short radiating chestnut-colored flammules under the suture and three narrow bands of chestnut spots, one above, one peripheral, one on the outer part of the base; surface shining, granulate above (under a lens), smoother beneath, and *with a few spiral impressed lines;* spire only a trifle elevated, obtuse; sutures well impressed; whorls 4½, convex, the last wide, gradually descending; aperture slightly oblique, broad lunar, whitish tinted with lilac inside; peristome very narrowly expanded, white, basal margin slightly sinuous, superior margin somewhat flattened, sloping; columellar margin a trifle dilated. Umbilicus deep, 2 mill. wide.

Alt. 9, diam. maj. 19, min. 16½ mill.

Alt. 9, diam. maj. 21, min. 17 mill.

Banks of the Amazon; New Grenada; Surinam.

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H. rosarium PFR., Proc. Zool. Soc, Lond. 1849, p. 131; Conchyl. Cab., p. 282, t. 124, f. 25–27; Monog. Hel. Viv., iii, p. 247.—REEVE, Conch. Icon., f. 569.

The color-pattern in the several specimens before me is quite constant. The superior part of the last whorl is convex, then sloping, giving the periphery the suggestion of an angle; and this appearance is often visible at the aperture.

H. KUHNI Pfeiffer. Pl. 59, figs. 55–57.

Umbilicate, depressed, thin, striatulate above and below rather densely granulated, diaphanous, pale reddish-corneous, with a subsutural zone of large spots (anteriorly bipartite), then some narrow obsolete bands, and below the periphery ornamented with an interrupted reddish fascia; spire a little elevated, apex plane; suture profound; whorls 4½, convex, regularly widening, the last angular above the middle, the angle vanishing anteriorly, a trifle descending, convex beneath; aperture slightly oblique, lunar, submargaritaceous inside; peristome thin, the margins distant, right margin very slightly expanded, basal slightly flexuous, very narrowly reflexed, columellar margin reflexed in a triangular plate, not closing the narrowly perforating umbilicus. (*Pfr.*)

Alt. 9, diam. maj. 17, min. 15 mill.

Paramaribo, Surinam.

H. kühni PFR., Malak. Blätter, xix, 1872, p. 74, t. 2, f. 8–10; Monographia Hel. Viv., vii, p. 434.

Closely allied to the preceding, but granulate beneath, and (apparently) lacking spiral lines there.

H. ANDICOLA Pfeiffer. Pl. 58, fig. 49.

Umbilicate, depressed, thin, granulate above and beneath, opaque, whitish-corneous, banded with a number of reddish interrupted, or spotted zones, the interstices flammulate with red; spire plane; whorls 4, convex, the last dilated, rounded; aperture rounded-lunar; peristome thin, margins joined by a thin callous, upper margin narrowly expanded, basal slightly reflexed, columellar dilated, reflexed, half covering the narrow umbilicus. (*Pfr.*)

Alt. 11, diam. maj. 20, min. 16½ mill.

Eastern Cordilleras.

H. andicola PFR., in Proc. Zool. Soc. Lond. 1845, p. 129; Monog. Hel. Viv., i, p. 382.—REEVE, Conch. Icon., f. 568.

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H. QUADRIVITTATA Hidalgo. Pl. 52, figs. 92, 93.

Covered perforate, depressed, thin, striatulate, and under a lens minutely granulate, corneous-brown, four-banded with chestnut-color, irregularly spotted and streaked with white; spire plane; suture impressed; whorls 4, convex, rapidly increasing, the last large, inflated, obtusely biangulate above, not descending in front; aperture lunate-circular, large, concolored; peristome thin, terminations joined by a very thin callous, basal margin a trifle reflexed, columella dilated, reflexed, covering the perforation. (*Hidalgo.*)

Alt. 11, diam. maj. 19, min. 15 mill. Aperture inside 11 mill. long, 11 wide.

Baeza, Ecuador.

H. quadrivittata HIDALGO, Journ. de Conchyl. 1869, p. 410; l. c. 1870, t. 6, f. 1; Mol. Viage al Pacifico, p. 10, t. 2, f. 6, 7.—PFEIFFER, Monog. Hel. Viv., vii, p. 274.

This shell bears much resemblance to *H. andicola* Pfr. From that species it may be distinguished easily by the characters of the umbilicus, the narrower aperture, the disposition and number of the bands, and especially by the angulation of the last whorl. (*Hidalgo.*)

H. DIPLOGONIA Dohrn. *Unfigured.*

Umbilicate, depressed, thin, all over granulate, corneous-white, painted with three narrow interrupted bands and sparcely spotted; spire a little elevated, apex plane; suture profound; whorls 4 to 4½, angulate near sutures and periphery, subplane between the angles; the last whorl is convex beneath, narrowly compressed around the umbilicus, scarcely descending anteriorly; aperture a little oblique, truncate-oval; peristome thin, margins joined by a thin callous, the right margin a little expanded, basal subreflexed, columellar dilated. (*Dohrn.*)

Alt. 11, diam. maj. 19, min. 16 mill.; aperture width 11 mill.

Eastern Peru.

Solaropsis diplogonia DOHRN, in Jahrb. d. deutsch. Mal. Gesell. 1882, p. 101.

It stands very near to *H. andicola* Pfr., but the 3 examples have two angles on the whorls, not shown by Pfeiffer's species. *H. quadrivittata* Hidalgo is still more nearly allied, but has the columellar expansion broader, covering the umbilicus.

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H. NUBECULATA Deshayes. Pl. 54, figs. 30, 31, 32.

Discoidal, pretty thick, convex above and beneath; spire very obtuse, perceptibly convex, formed of 5 rounded whorls; suture simple, pretty deep; whorls gradually increasing, shell smooth or with light irregular lines of growth; base convex, perforated by a moderate umbilicus. Aperture large, wider than high, semilunar, a little oblique; peristome thin, a little expanded above, obtuse below, columella sinuous. Color grayish or yellowish, longitudinally clouded with undulating streaks, shading at their edges into the ground-color; base without markings.

Alt. 11–12, diam. 19 mill.

H. nubeculata DESHAYES, Mag. de Zool. 1831, t. 28; in Fér., Hist., vol. i, p. 66, t. 69I, f. 1–4.—PFEIFFER, Monog. Hel. Viv., i, p. 387.

A species which has not been recognized with certainty in recent times. The above description is from that of Deshayes.

H. CATENIFERA Pfeiffer. Pl. 52, figs. 99, 100, 101.

Umbilicate, depressed, thin, closely granulate, diaphanous, pale brown, ornamented with interrupted, varied, chain-like bands; spire subplane; whorls 5, a little convex, the last ventricose, scarcely descending anteriorly; base convex; umbilicus funnel-shaped; aperture subvertical, lunate rounded; peristome thin, the margins converging, superior and basal margins hardly expanded, the columellar a little dilated. (*Pfr.*)

Alt. 12, diam. maj. 25½, min. 21 mill.

Andes of New Grenada.

H. catenifera PFR., in Proc. Zool. Soc. Lond. 1852, p. 152; in Küster's Conchyl. Cab., p. 367, t. 139, f. 6–8; Monog. Hel. Viv., iii, p. 248.—REEVE, Conch. Icon., f. 570.

H. MARMATENSIS Pfeiffer. Pl. 58, figs. 43–45.

Umbilicate, small, fragile, depressed, light corneous, whitish beneath, with five girdles of chestnut-brown spots, squarish in shape, and with a slight tendency to form oblique streaks; four rows of spots above, one below the periphery; the first two often subcoalescent; surface dull, lusterless, under a lens seen to be minutely granulate, and covered with very short hairs; spire nearly flat; suture deeply impressed; whorls 4 to 4½, quite convex, the last rounded and convex, scarcely descending in front; aperture rounded-

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lunar, a little oblique, margins of peristome converging, joined by a very thin callous, outer and basal margins very narrowly expanded, columellar slightly dilated; umbilicus 1 to 1¼ mill. in width, deep.

Alt. 6, diam. maj. 11½, min. 9¾ mill.

Alt. 6, diam. maj. 12, min. 10½ mill.

Marmato, New Grenada.

H. marmatensis PFR. in Proc. Zool. Soc. Lond. 1854, p. 57; Monog. Hel. Viv., iv, p. 295.—REEVE, Conch. Icon., f. 1308.

One of the smallest species of Solaropsis. It may be known by the color-pattern, lusterless, hirsute surface, and convex, not angular whorls.

H. INCARUM Philippi. Pl. 52, figs. 96, 97, 98.

Umbilicate, orbicular, plane, densely punctate-granulate, very thin, yellowish, ornamented with three interrupted reddish-chestnut bands, and a subsutural series of flammules, unicolored beneath; spire plane; whorls 5, convex, the last cylindrical; aperture broad lunar; peristome thin, reflexed, columellar margin produced, slightly expanded. (*Philippi.*)

Alt. 11, diam. maj. 22, min. 20 mill.

Dept. of Cuzco, Peru.

H. incarum PHIL., in Malak. Blätter, xvi, p. 36 (1869); and in PFR., Novit. Conch., iii, p. 475, t. 102, f. 19–21; and Monog. Hel. Viv., vii, p. 450.

The peristome is only slightly reflexed above, much more strongly below and thickened, but scarcely enough to be called callous. The columellar margin is considerably produced, so that the aperture is rendered lunate by the penultimate whorl projecting into it. (*Phil.*)

H. MONILE Broderip. Pl. 53, figs. 11, 12, 13.

Very broadly umbilicated, subdiscoidal, thin, very minutely granulated, translucent, pale corneous, ornamented above with a series of angular streaks or spots; whorls 4½, convex, the last inflated; aperture vertical, lunate-circular; peristome simple, narrowly expanded above, reflexed beneath. (*Pfeiffer.*)

Alt. 10, diam. maj. 25, min. 21 mill.

Salango and Marmato, Colombia.

H. monile BROD., Proc. Zool. Soc. Lond. 1832, p. 29; DESHAYES, in Fér., Histoire, p. 4, t. 69B, f. 4.—PFEIFFER, Monog. Hel. Viv., i, p. 389.—REEVE, Conch. Icon., f. 572.—BLAND, in Ad., Contrib. to

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Conch., p. 232.—*H. planorbis* JAY, Catalogue, p. 112, t. 1, f. 6, 7 (1839).—*Eyryomphala monile* BECK, Index, p. 8.—*Psadara boetzkesi* MILLER, Malak. Blätter, XXV, p. 163, t. 7, f. 4.

More broadly umbilicated than any other described species of this group. I agree with Dr. Dohrn in considering *Psadara boetzkesi* of Miller (Pl. 54, figs. 27, 28, 29) doubtfully distinct, and in any case insufficiently characterized.

H. CASTELNEAUDII Deville et Hupé. Pl. 54, figs. 21–23.

Umbilicate, depressed, thin, diaphanous, a little shining, tawny, with a series of subquadrangular reddish spots at the suture, and an interrupted band below; spire nearly flat; suture profound; whorls 5, convex, granulate, the last scarcely descending, obliquely rugose-plicate, more convex beneath; umbilicus open, equaling one-sixth the diameter of shell, funnel-shaped; aperture a little oblique, rounded-lunar, margaritaceous inside; peristome narrowly expanded, margins converging, columella dilated above. (*Pfr.*)

Alt. 6½, diam. maj. 18, min. 15½ mill.

Mission of Sarayacu, Peru.

H. castelneaudii DEVILLE ET HUPPE in Rev. et Mag. de Zool. 1850, p. 639, t. 14, f. 3.—PFR. Mon. Hel. Viv., iii, p. 248.—*H. Castelnaudii* HUPE in Casteln., Exped. dans l'Amér. du Sud, Moll., p. 11, t. 2, f. 4.—H. *castelnaui* PFR. in Malak. Blätter, v, p. 159; Monographia Hel. Viv., iv, p. 295.—MARTENS, Malak. Blätter, xiv, p. 134.

H. SELENOSTOMA Pfeiffer. Pl. 52, figs. 1, 2, 3.

Umbilicate, depressed, thin, fragile, translucent, light brown, with a series of chestnut spots below the suture, and with or without several interrupted narrow brown bands; surface covered with granules arranged in oblique rows (and according to Pfeiffer, short hairs), smoother around the umbilicus; spire plane, whorls 4½, very convex, separated by profound sutures, the last convex; aperture lunar, a little oblique; peristome thin, white, narrowly expanded all around, subreflexed below, and slightly expanded at the umbilicus; umbilicus very narrow inside, funnel-shaped, width 2½ to 3 mill.

Alt. 11, diam. maj. 26, min. 21 mill.

Alt. 11, diam. maj. 24, min. 19 mill.; aperture, greatest width 14, alt. 12½ mill. (Meas. outside peristome.)

Gualea and Valley of Pilaton, Ecuador.

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H. selenostoma PFR., Proc. Zool. Soc. Lond. 1852, p. 152, Conchyl. Cab., p. 366, t. 139, f. 3–5; Monog. Hel. Viv., iii, p. 248. —*H. sclerostoma* REEVE, Conch. Icon., f. 571.—*Psadara selenostoma* MILLER, Mal. Bl., XXV, p. 162.—COUSIN, Faune Mal. Rép. Equateur, p. 66.

The surface sculpture is much coarser and less dense than in H. hians, the granules being perfectly obvious to the naked eye. The mouth and umbilicus are both wider than in H. tiloriensis.

Animal light grayish-brown, granulate, very long, measuring more than three times the diameter of the shell, which is situated pretty nearly centrally. The tentacles are pretty stout, very long, lighter colored than the animal, terminating in a blackish gray bulb. (*Cousin.*)

H. HIANS Pfeiffer. Pl. 59, figs. 53, 54.

Almost covered perforate, depressed, thin, fragile, subtranslucent, horn-color, with a series of angular dark chestnut spots below the suture, and generally several narrow bands and lines encircling the last whorl, *closely obliquely streaked with light chestnut;* surface lusterless, very densely, regularly microscopically granulate; spire flat, whorls 4 to 4½, very convex above, separated by profound sutures, the last one very wide, gently descending in front, rounded, convex; aperture suboblique, large, rounded-lunar; peristome thin, very narrowly expanded, the basal margin slightly reflexed, columellar with a short expansion *almost covering the narrow perforation.*

Alt. 12, diam. maj. 25, min. 20 mill.

Marmato, Colombia.

H. hians PFR. in Proc. Zool. Soc. Lond. 1845, p. 130; Monog. Hel. Viv., i, p. 389.—REEVE, Conch. Icon., f. 573.

Distinct from other species in the streaked color-pattern and very narrow, almost closed umbilical perforation. The whorls widen more rapidly than in *H. selenostoma* or *tiloriensis.* The shell is very fragile. The specimen before me is from Marmato, labeled by BLAND.

H. TILORIENSIS Angas. Pl. 50, figs. 79–81.

Narrowly umbilicate, depressed, thin, fragile, pale brown, with a subsutural series of small brown dashes, an interrupted narrow dark band on the upper convexity of the whorls, another narrower one on the periphery, and a continuous one beneath; the intervening spaces closely marked with narrow oblique or zigzag light chestnut stripes;

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surface covered with granules arranged in regular oblique rows, bearing short hairs; spire plane; whorls 4½, very convex, separated by profound sutures, the last wide, inflated; aperture nearly vertical, lunar, narrow, embracing a considerable part of the penultimate whorl; peristome very narrowly expanded, columellar margin dilated and partly covering the umbilicus; umbilicus narrow, width 1⅓ mill.

Alt. 11½, diam. maj. 18, min. 15 mill. Aperture, greatest width 12, alt. 11 mill. (Meas. outside peristome.)

Hills between the rivers Tilorio and Zhorquin, Costa Rica.

H. (*Solaropsis*) *tiloriensis* ANGAS, Proc. Zool. Soc. Lond., 1879, p. 477, t. 40, f. 2.

This form has a narrower aperture than *H. selenostoma* or *hians*. *H. iris* Miller is similar in form, but different in coloration.

H. IRIS Miller. Pl. 56, figs. 6, 7, 8.

Umbilicate, orbicular-depressed, very thin, diaphanous, shining, corneous, maculate with tawny, above with irregular reddish streaks, body with two interrupted spiral bands; surface pilose (or granulate); spire plane; whorls 4¾, very convex, the last rounded, a little descending in front; aperture rounded-lunar, a little oblique, peristome thin, expanded, above broadly expanded, ascending, columellar margin dilated, partly covering the umbilicus, the margins converging, scarcely connected by a callus. (*Miller.*)

Alt. 11–13, diam. maj. 23–25, min. 19–21 mill.

Valley of Pilaton, Ecuador, 1000 meters alt.

Psadara iris MILLER, Malak. Blätter, XXV, 1878, p. 163, t. 7, f. 3.

Close to H. tiloriensis, but different in coloration etc. Fig. 6 of my plate is incorrect in lacking an umbilicus. It should be 2 mill. wide, a trifle impinged upon by the expansion of the columellar lip.

H. RUGIFERA Dohrn. *Unfigured.*

Broadly umbilicate, deplanate, thin, obliquely rugose-plicate, the plicæ vanishing beneath, brownish-corneous, flammulate at the sutures and narrowly 2-banded in the middle of the whorl with reddish; spire plane, apex rather smooth; suture moderately profound; whorls nearly 5, convex, the last rounded, not descending in front; umbilicus equaling ¼ the diameter, funnel-shaped; aperture a little oblique, rounded-lunar; peristome [unknown]. (*Dohrn.*)

Alt. 12, diam. maj. 26, min. 22 mill.

Eastern Peru.

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Solaropsis rugifera DOHRN, Jahrb. d. deutsch. Mal. Gesell 1882, p. 100.

I possess, unfortunately, only a single specimen of this species, not fully adult, which I received years ago with other species from Eastern Peru. On account of the sculpture, which differs remarkably from that of all allied forms, I have decided to give an (admittedly) incomplete description, in the hope that some one may be able to complete it. *H. selenostoma* Pfr., which is the nearest species in contour, is more narrowly convoluted, proportionally higher, and more narrowly umbilicated. (*Dohrn.*)

H. ELAPS Dohrn. *Unfigured.*

Narrowly umbilicated, depressed-globose, thin, striatulate and all over minutely granulate, fulvous-corneous, ornamented with several narrow interrupted bands; spire very obtuse, depressed-globose; suture profound; whorls 5, convex, rapidly increasing, the last rounded, compressed around the perforation, descending in front; aperture a little oblique, rounded-lunar; peristome thin, expanded a little, margins distant, the columella dilated. (*Dohrn.*)

Alt. 10½, diam. maj. 15½, min. 14 mill.

On the Tapajos River, Province of Pará.

Solaropsis elaps DOHRN, Jahrb. d. deutsch. Mal. Gesell. 1882, p. 102.

Separated from all other species by its globular form.

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APPENDIX.

The following errata should be corrected in the text with pen or pencil; errors and confusion will thereby be avoided:

Page 38, under DIALEUCA, substitute *H. fuscocincta* for "*H. fuscolabris*" as the type of *Leptoloma*.

Page 44, second line of description of H. DENNISONI, read *deep maroon color* instead of "deep narrow color."

Page 55, after Var. SUBBROCHERI, read *Pl.* 32, *fig.* 59, not fig. 60.

Page 67, after H. TRINITARIA, read *Pl.* 17, *figs.* 38–40, 42, 43.

Page 74, fourth line of remarks under *H. dominicensis*, read *penultimate* instead of "antepenultimate."

Page 83, after H. OBESA, add *Pl.* 29, *figs.* 37, 38.

Page 120, after H. CAROCOLLA, add *Pl.* 24, *fig.* 39.

Page 164, after H. PLICATA, var., read *Pl.* 63, *figs.* 6, 7, 8.

Page 159, to synonymy of LABYRINTHUS, add *Lyrostoma* SWAINSON, 1840.

HEMITROCHUS.

H. GAUSSOINI Tryon. Pl. 63, figs. 14, 15.

After the part of this volume containing the description of this species (page 47) was in type, I was fortunate enough to find the specimens.

The shell is globose-depressed, with the tiniest umbilical rimation, thin but rather strong. The color is white, because the two shells before me have lost the cuticle, having been long dead and weathered. The surface has oblique, rather fine and irregular growth-striæ. The spire is low-conoidal; whorls 5½, slightly convex, slowly regularly widening, the last depressed-globose, rounded on periphery and base, scarcely descending anteriorly. The aperture is oblique, rounded lunar; peristome sharp, not expanded nor reflexed, regularly curved in every part, the baso-columellar margin decidedly thickened with callous inside, widest at the insertion, and a mere trifle dilated over the scarcely perforate axis.

Alt. 6½, diam. maj. 10, min. 9 mill.

[A closely allied form has recently been sent to the author from Caymen Island, south of central Cuba. It is more depressed than

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H. gaussoini, and has brown zones. The name of *H. Streator* will be given it in honor of the finder.

EURYCAMPTA Alb.

H. EXDEFLEXA Pilsbry. Pl. 3, figs. 16, 18, 20.

Narrowly umbilicate, almost closed by the expanded lip, depressed, rather solid, corneous-brown, generally with traces of two or three spiral chestnut zones above; surface shining, finely, densely, obliquely striate; spire low, apex obtuse, the first 1½ whorls shining; whorls 4½, convex, slowly widening, the last a little dilated transversely, strongly deflexed in front, rounded at periphery; aperture very oblique, oval; peristome white or nearly so, quite broadly and flatly expanded all around, basal margin strongly thickened within, terminations converging, joined across the parietal wall by a rather heavy deposit of white callous.

Alt. 12, diam. maj. 20, min. 16 mill.

Jurisdiction of Baracoa, Cuba.

H. deflexa PFR., Zeitschr. f. Mal., 1845, p. 150; Küster's Conchyl. Cab., t. 60, f. 21, 22; Monog. Hel. Viv. i, p. 342.—ARANGO, Fauna Mal. Cubana, p. 78.—(Not *H. deflexa* A. BRAUN, Verh. d. Naturf. Vers. zu Maintz, 1842, p. 149; and SANDBERGER, Land u. Süsswasser Conchyl. der Vorwelt, p. 383, a Lower Miocene species of *Macularia*.)

This species is a *Eurycampta*, allied to *H. supertexta*, *H. Poeyi*, etc., and should have been included in Vol. iv, p. 82. Pfeiffer (Noment. Hel. Viv.) includes it in *Thelidomus*; but this is an error. The bands are sometimes quite distinct, sometimes faint or altogether lacking. The shell is then usually obscurely obliquely streaked.

I describe the species in this place because I had already figured it on Pl. 3, among the *Thelidomus*, under the impression that Pfeiffer was correct in referring it to that group. The change of name adopted above is the more necessary because *H. deflexa* Braun is quite similar to the present species in form.

PARTHENA?

H. (PARTHENA?) SANCTÆLUCIÆ E. A. Smith. *Unfigured.*

Shell depressed, orbicular, narrowly perforate, thin, shining, vinous-corneous, at the peripheral carina pale or greenish; whorls 5, slowly widening, somewhat convex above, radiately strongly plicate, microscopically spirally striate; last whorl carinated a little

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above the middle, scarcely descending, lightly plicate below the carina, very delicately sculptured with spiral and incremental striæ; aperture lunate; peristome vinous-brown, narrowly expanded and reflexed, slightly dilated above the umbilicus, margins connected by a very thin callous. (*Smith.*)

Alt. 9½, diam. maj. 18, min. 14½ mill.

This species is remarkable on account of the strongly plicate upper surface which contrasts with the comparatively smooth base; the first two whorls, forming the top of the spire are smooth, and the plicæ gradually develop in thickness upon the remaining volutions. Upon the last whorl they are interrupted by the pale keel, and soon attenuate and become obsolete beneath it. The keel passes right round the whorl, but does not modify the regular curve of the labrum.

The foot of the animal is of a vinous tint, and the mantle is conspicuously marbled with coal-black. (*Smith.*)

Santa Lucia, W. I.

Helix (*Hadra*) *sanctæ-luciæ* SMITH, in Ann. and Mag. Nat. Hist. 1889 (6th ser., vol. iii), p. 402.

The subgeneric position of this species is not known to me. It is certainly not a *Hadra*.

NOTE.—The first three members of the present volume, each containing 64 pp. text and accompanying plates were issued on the following dates: 1, April 17; 2, July 5; 3, Sept. 30.

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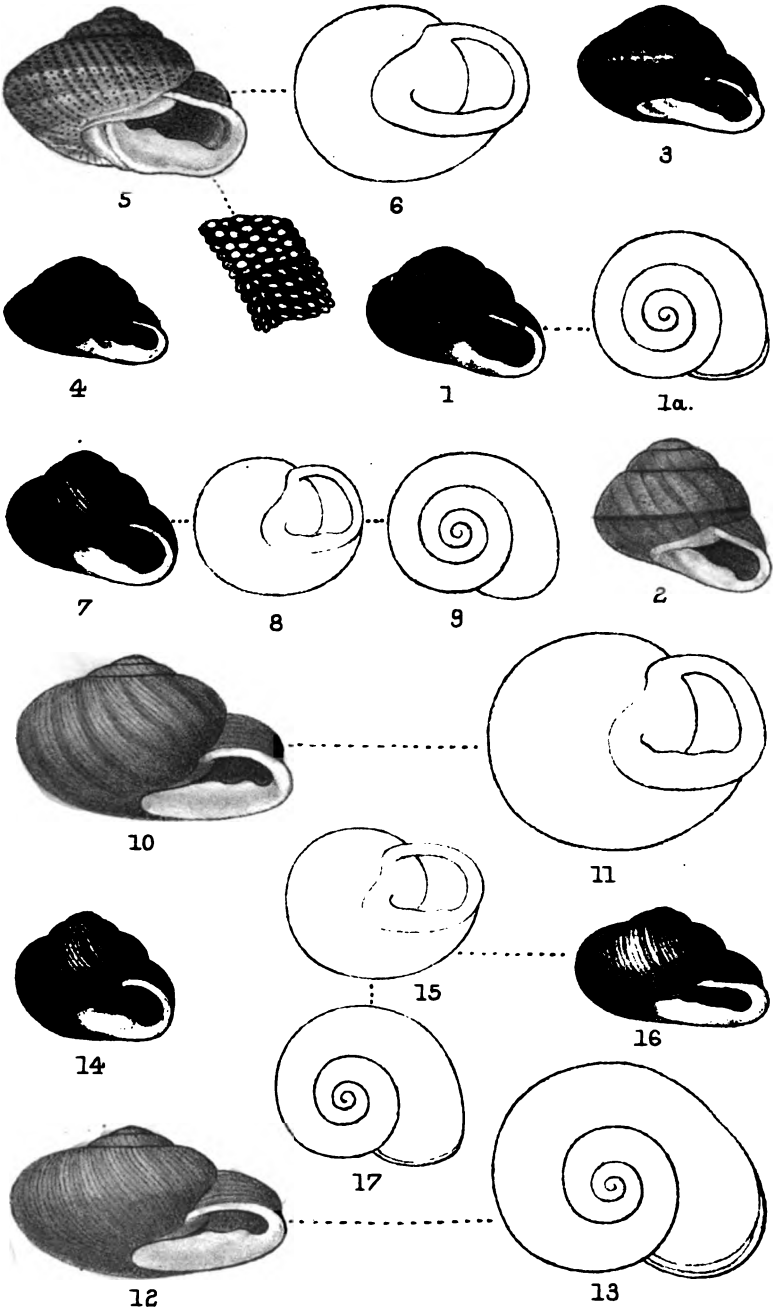

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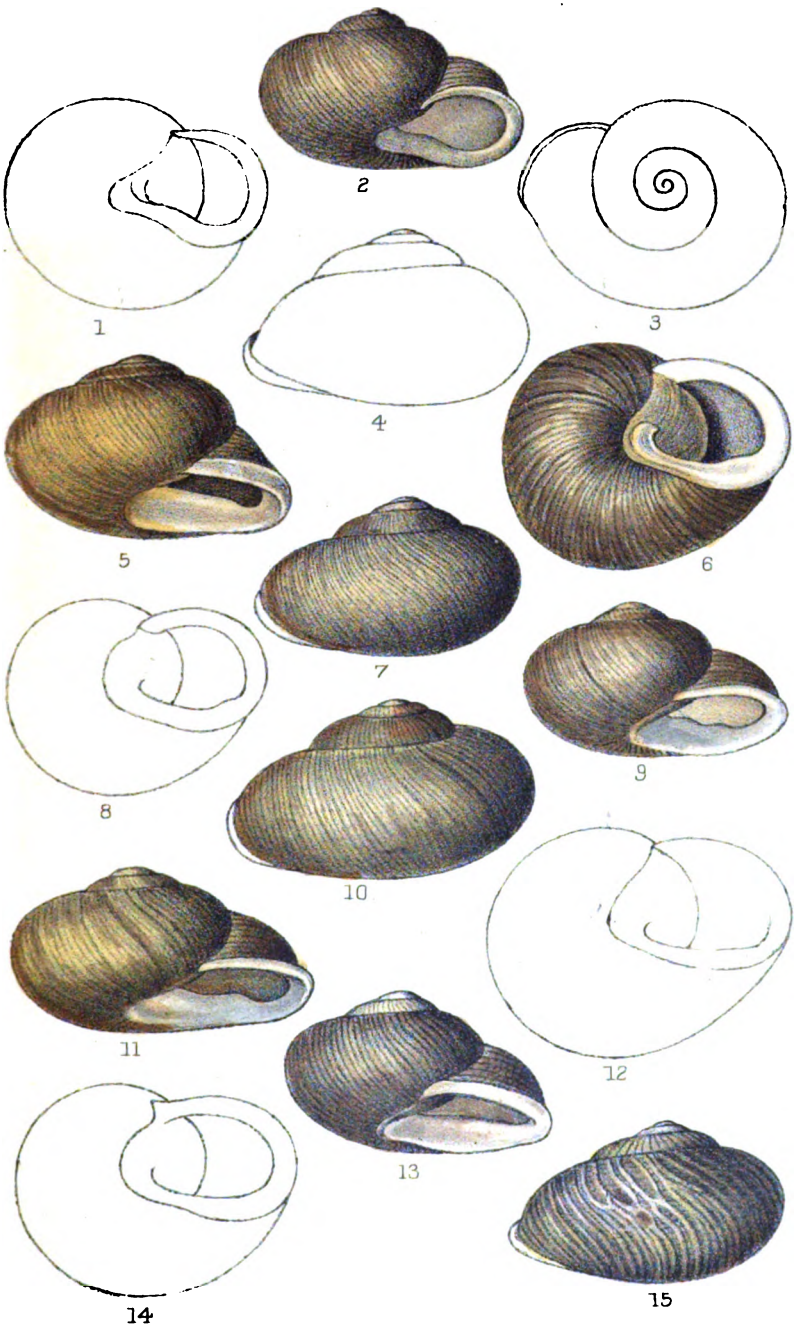

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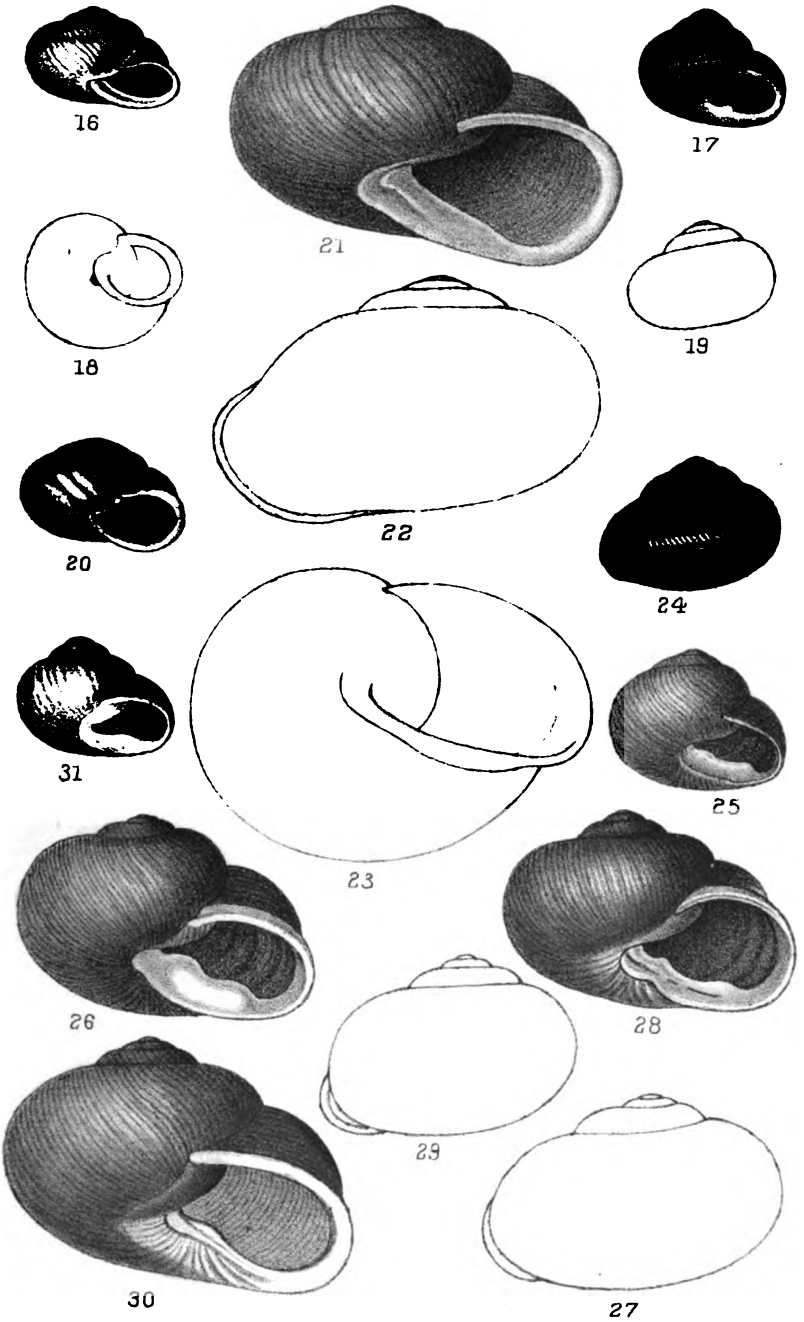

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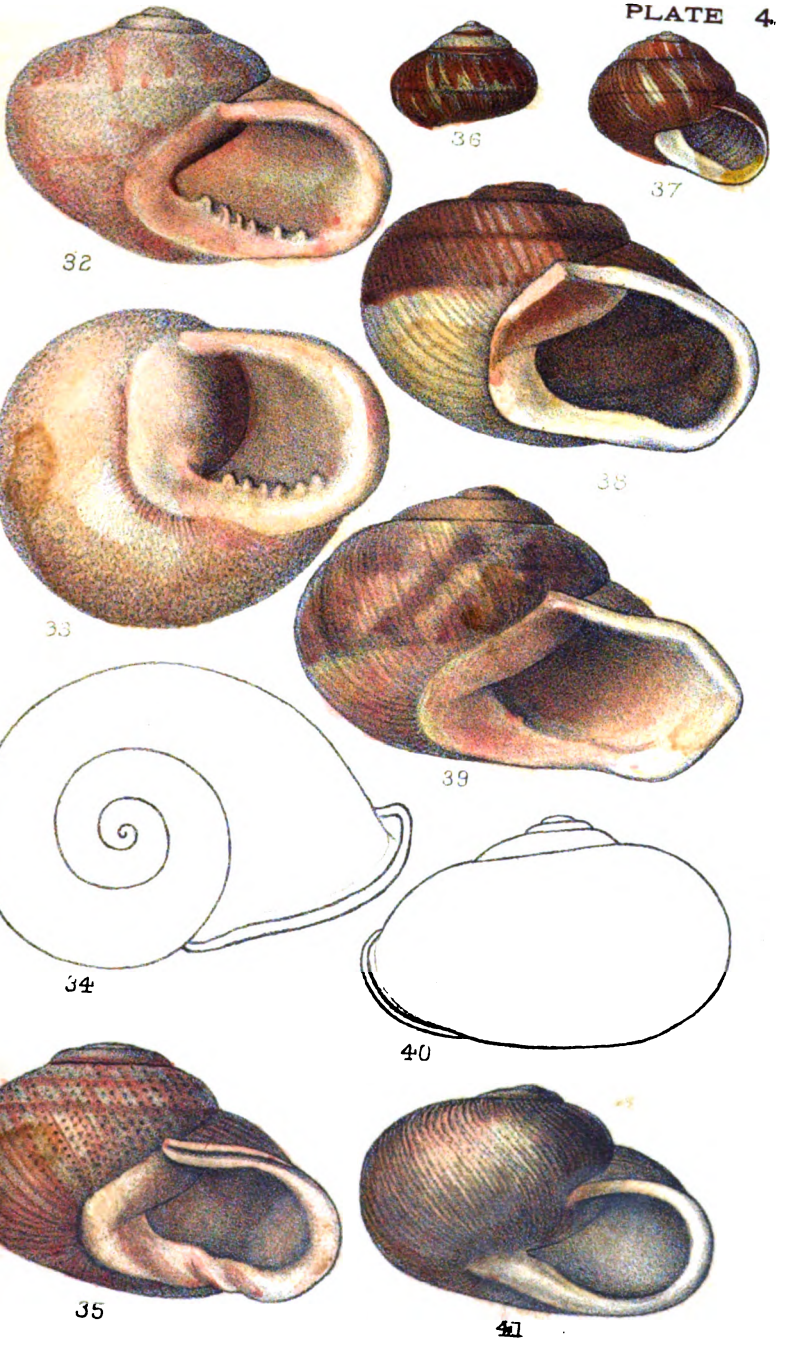

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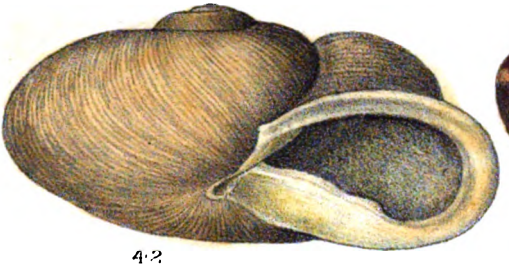

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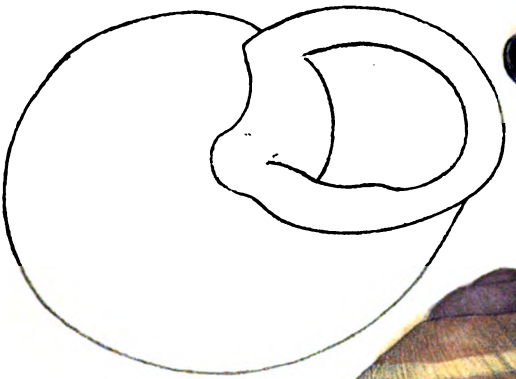

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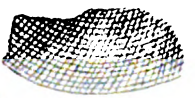

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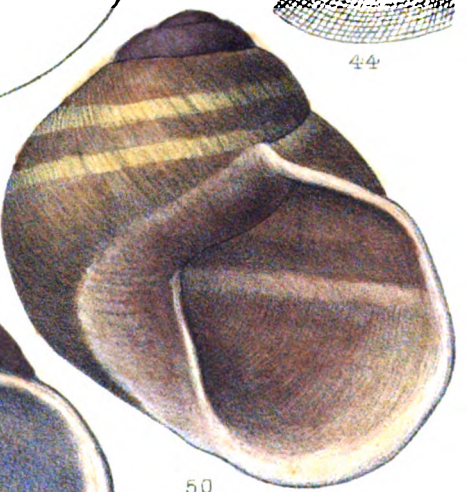

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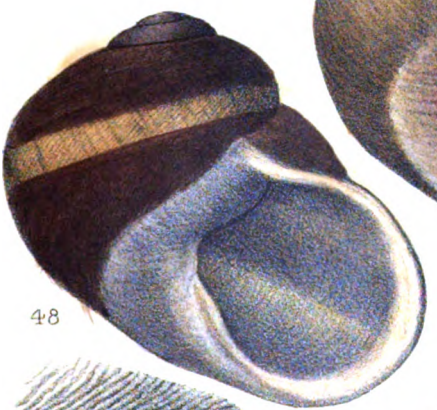

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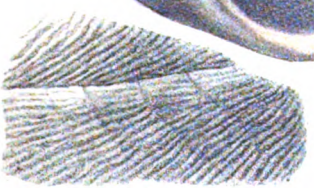

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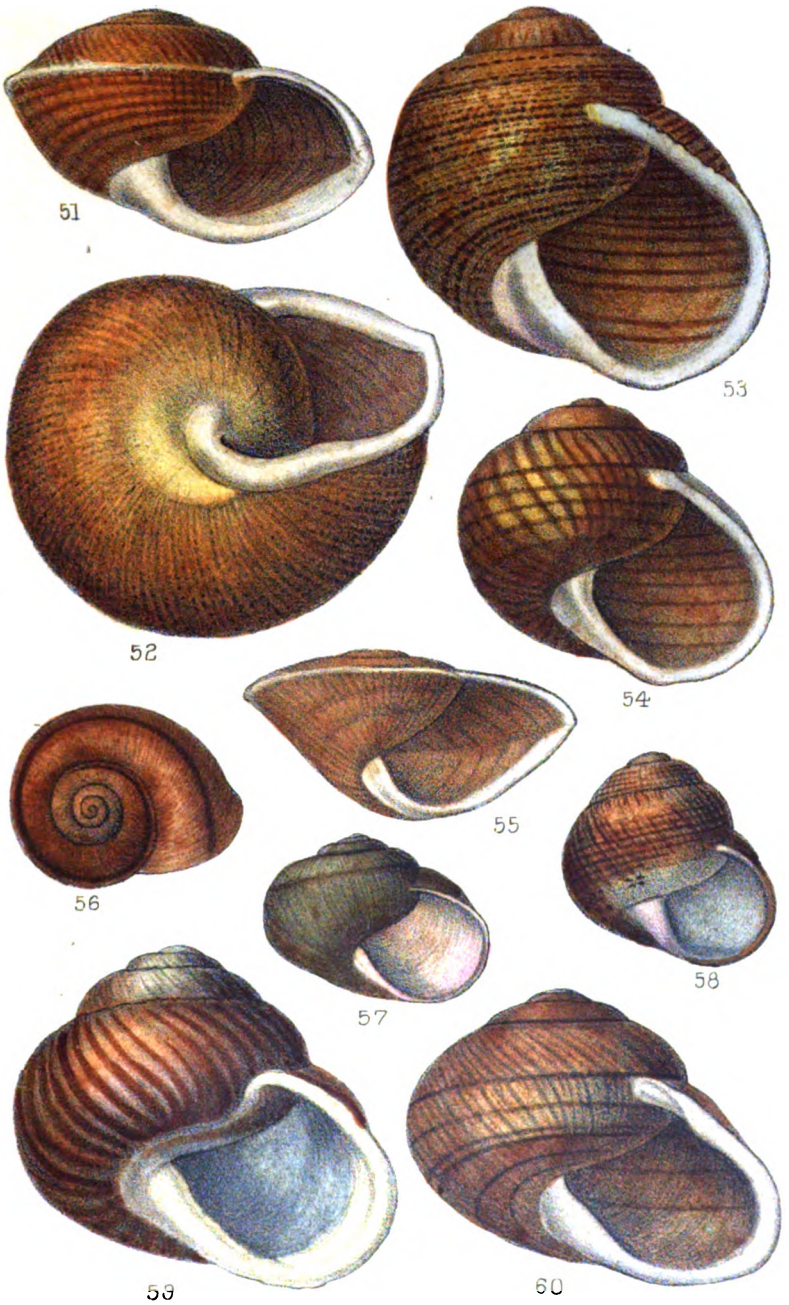

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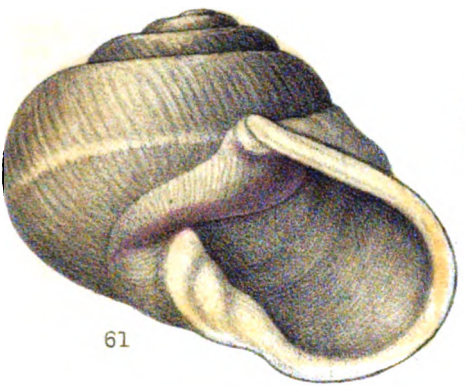
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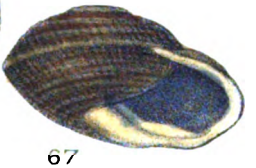
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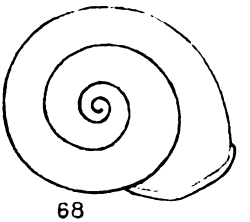
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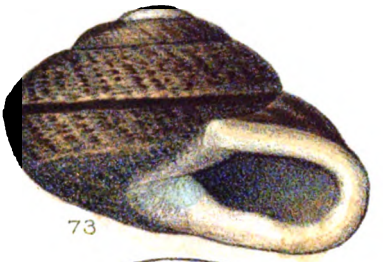

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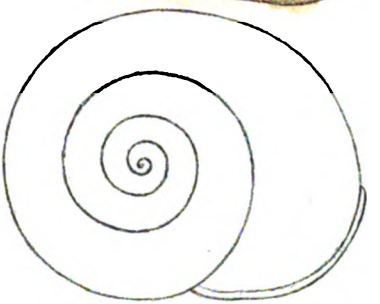

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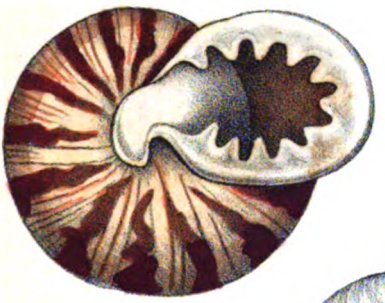

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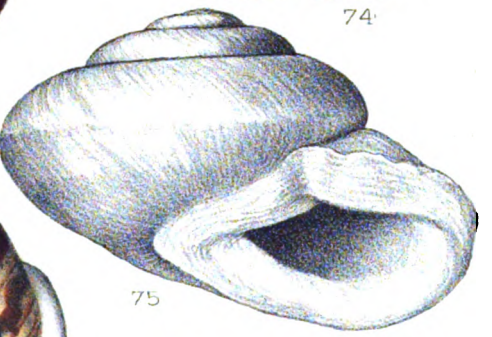

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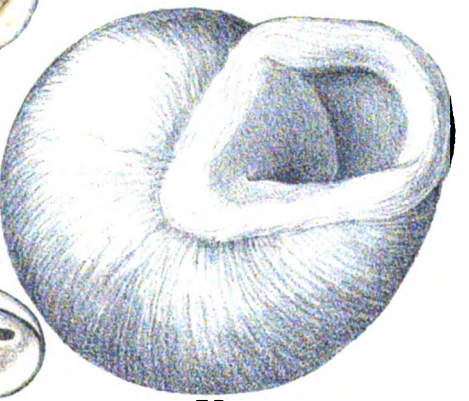

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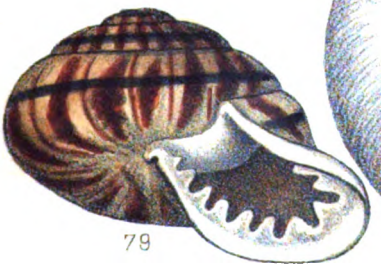

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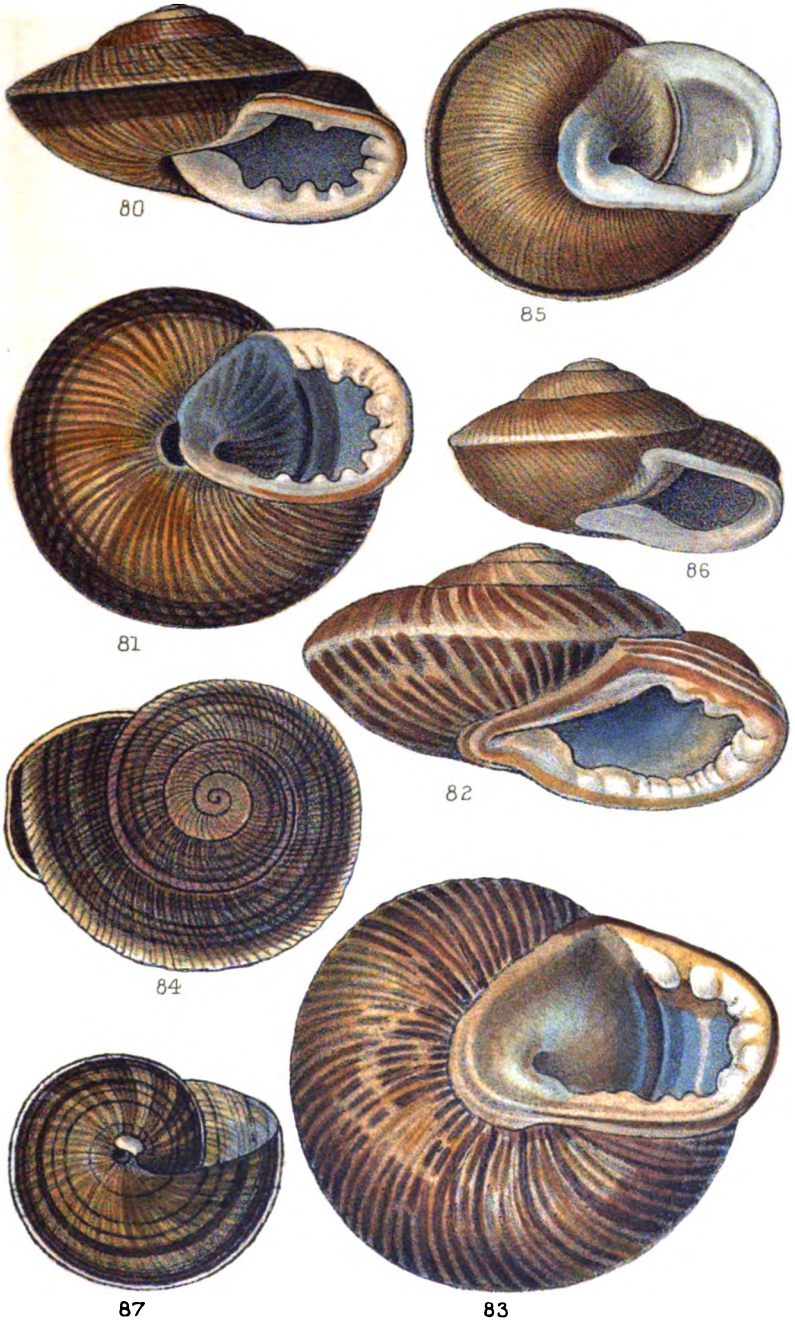

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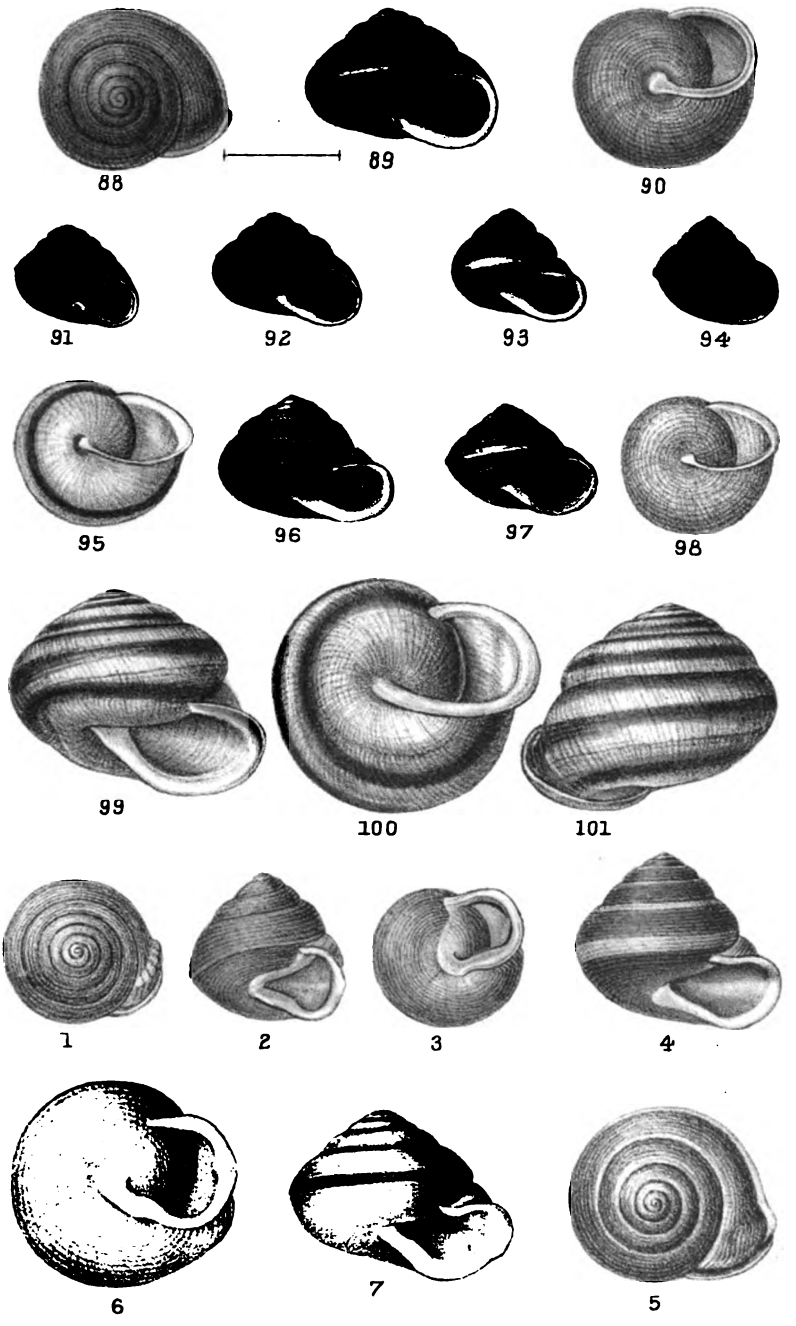

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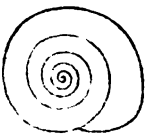
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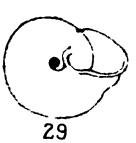
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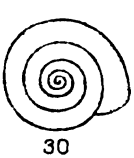
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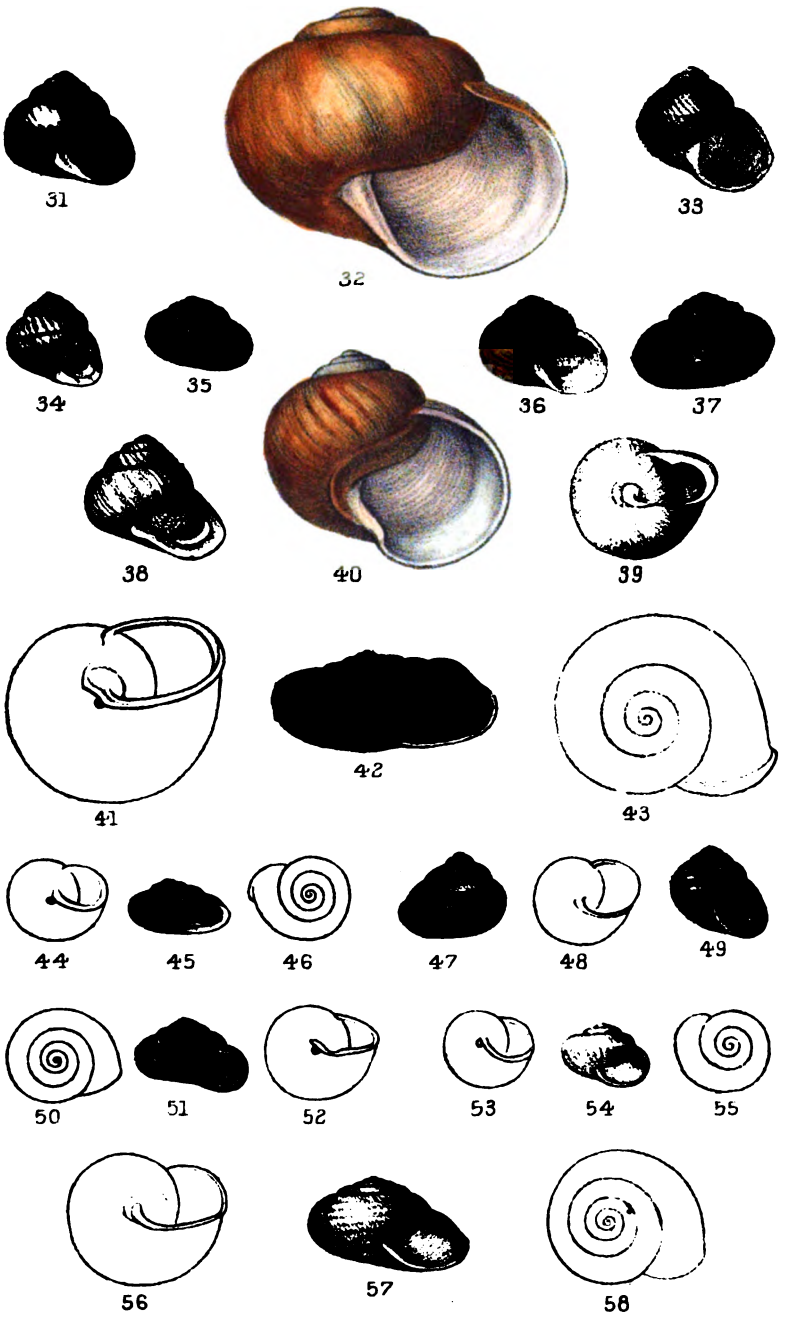

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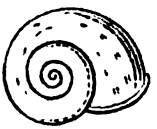
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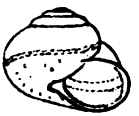
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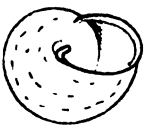
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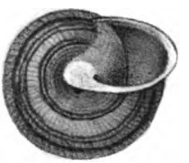
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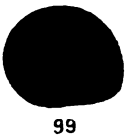
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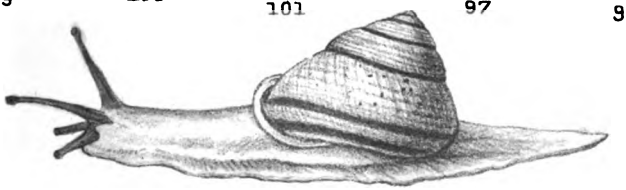
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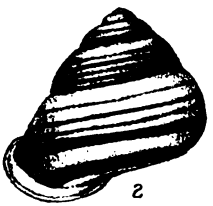
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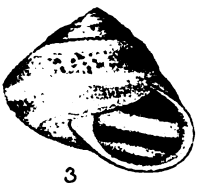
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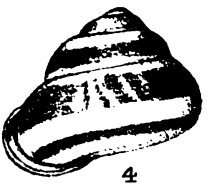
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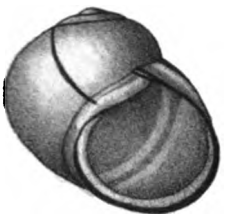
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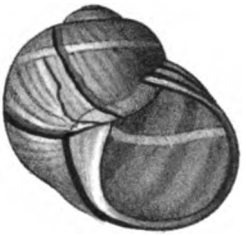
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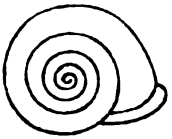
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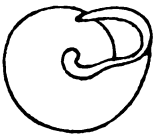
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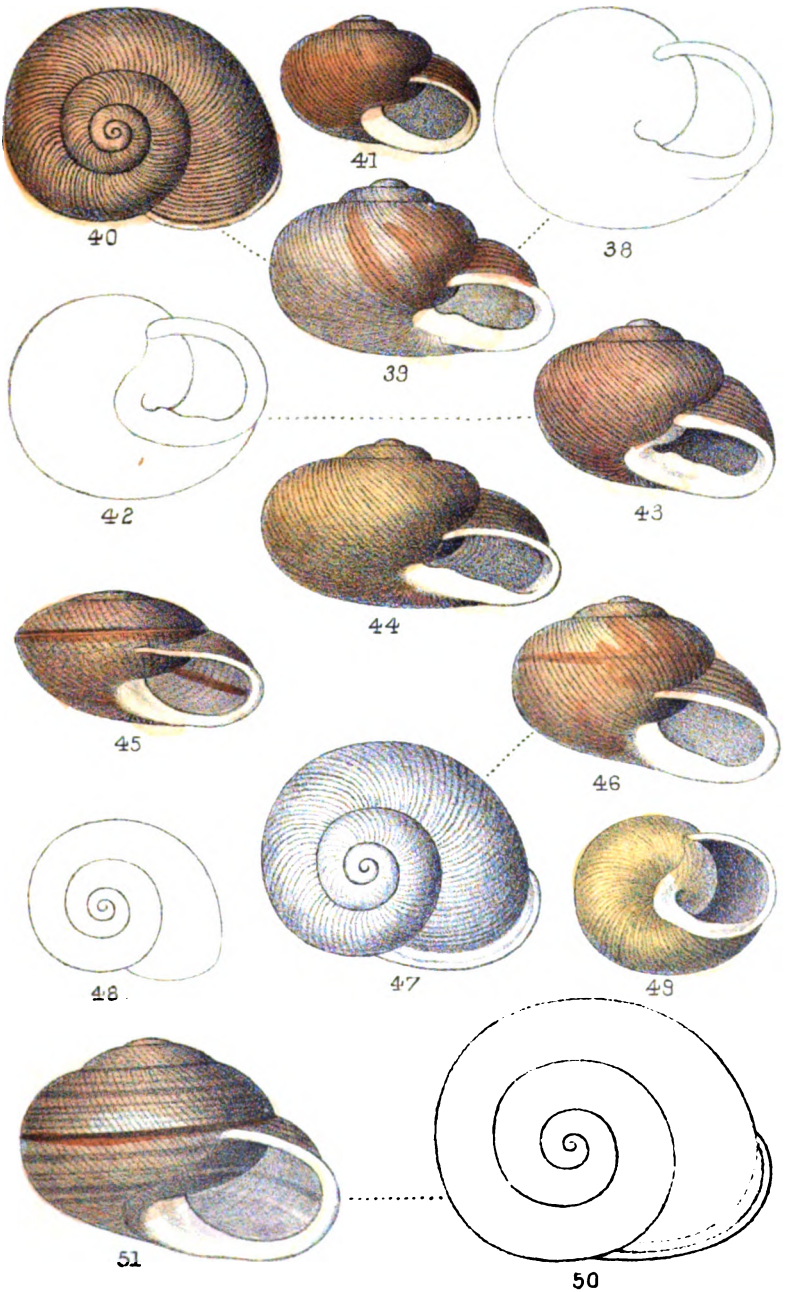

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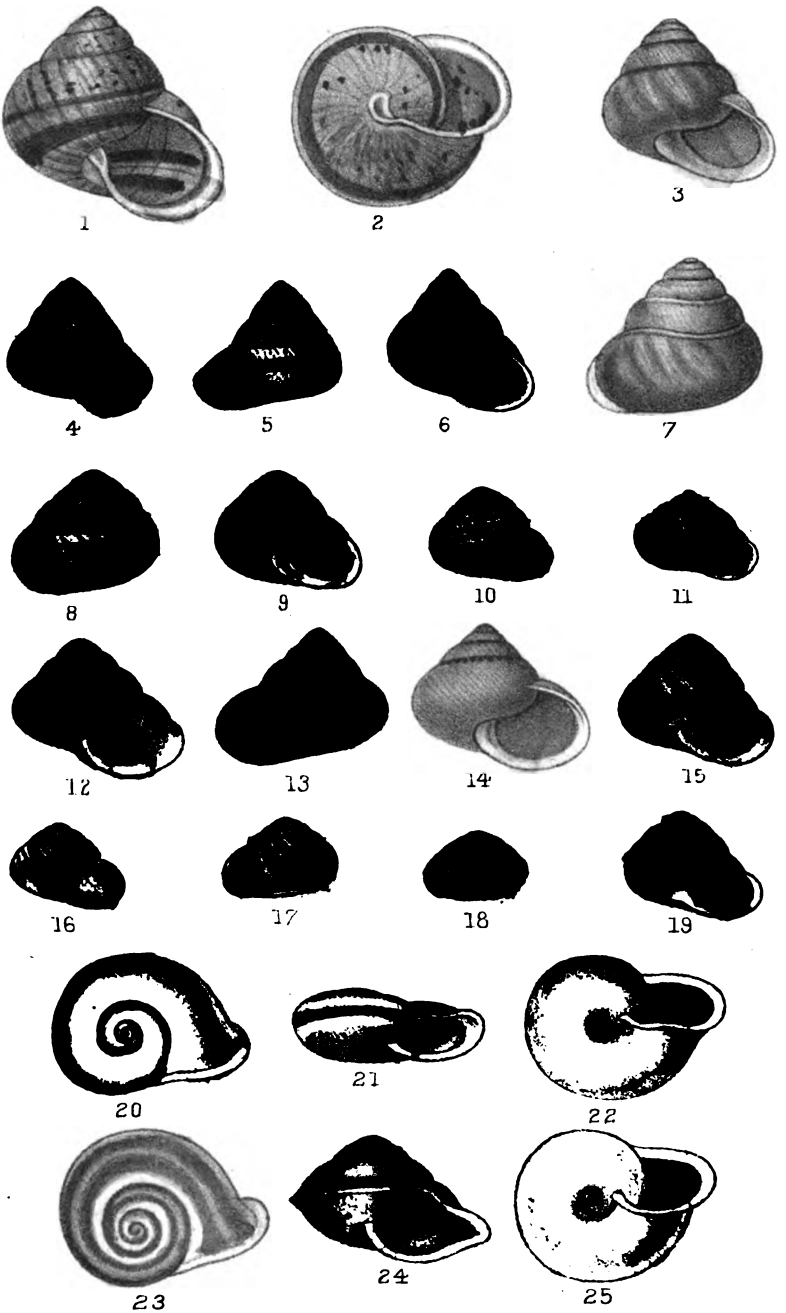

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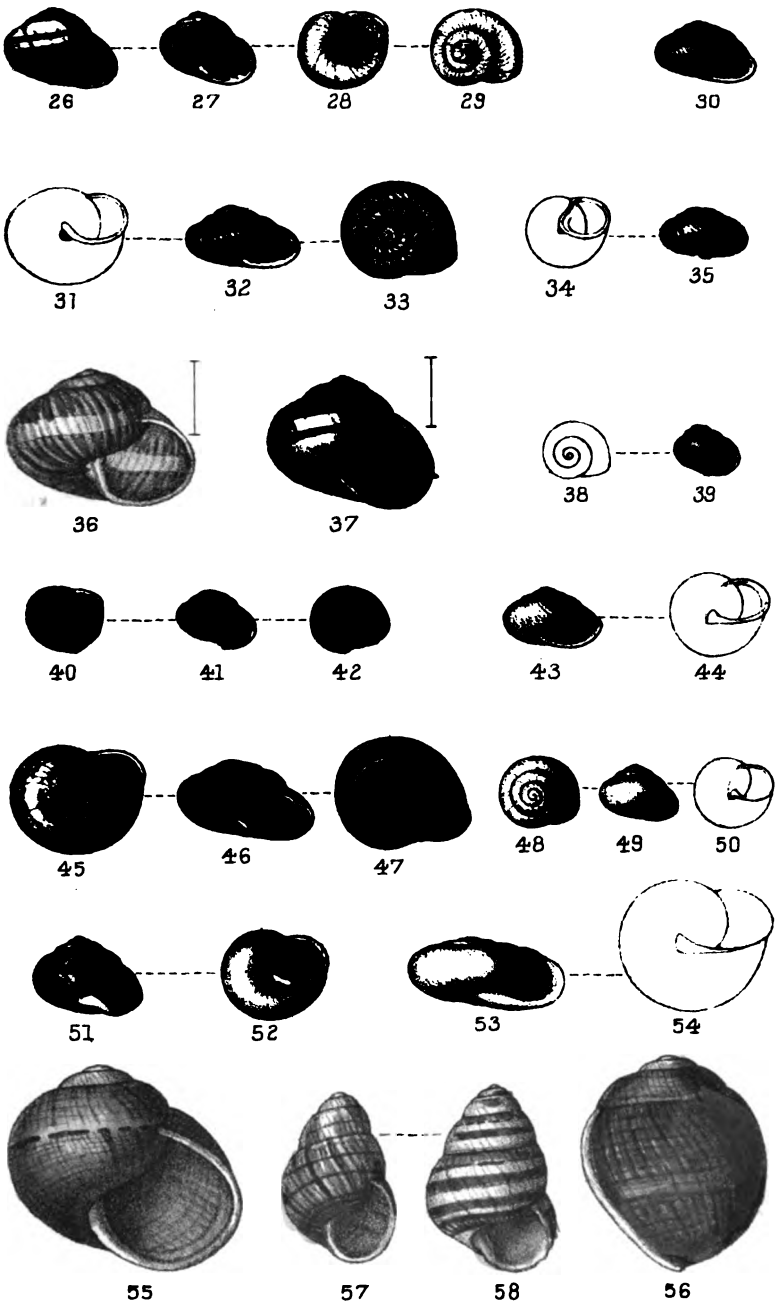

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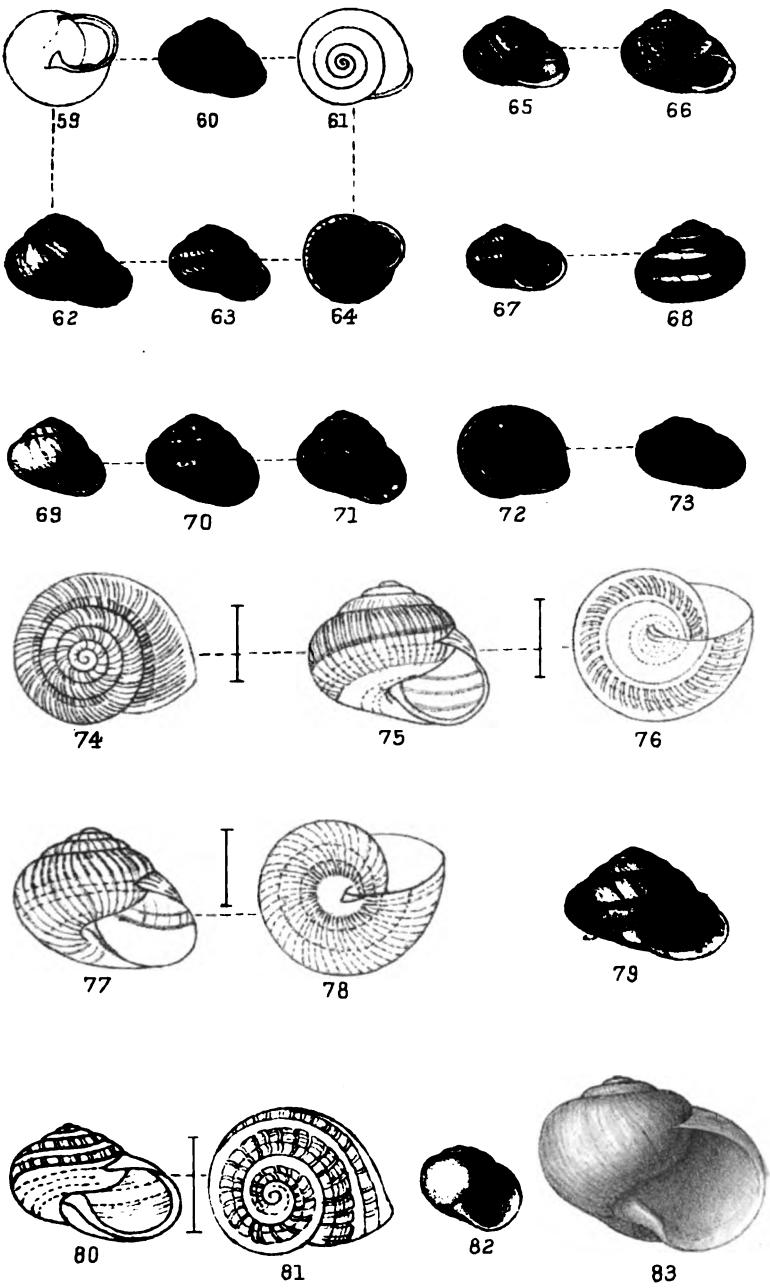

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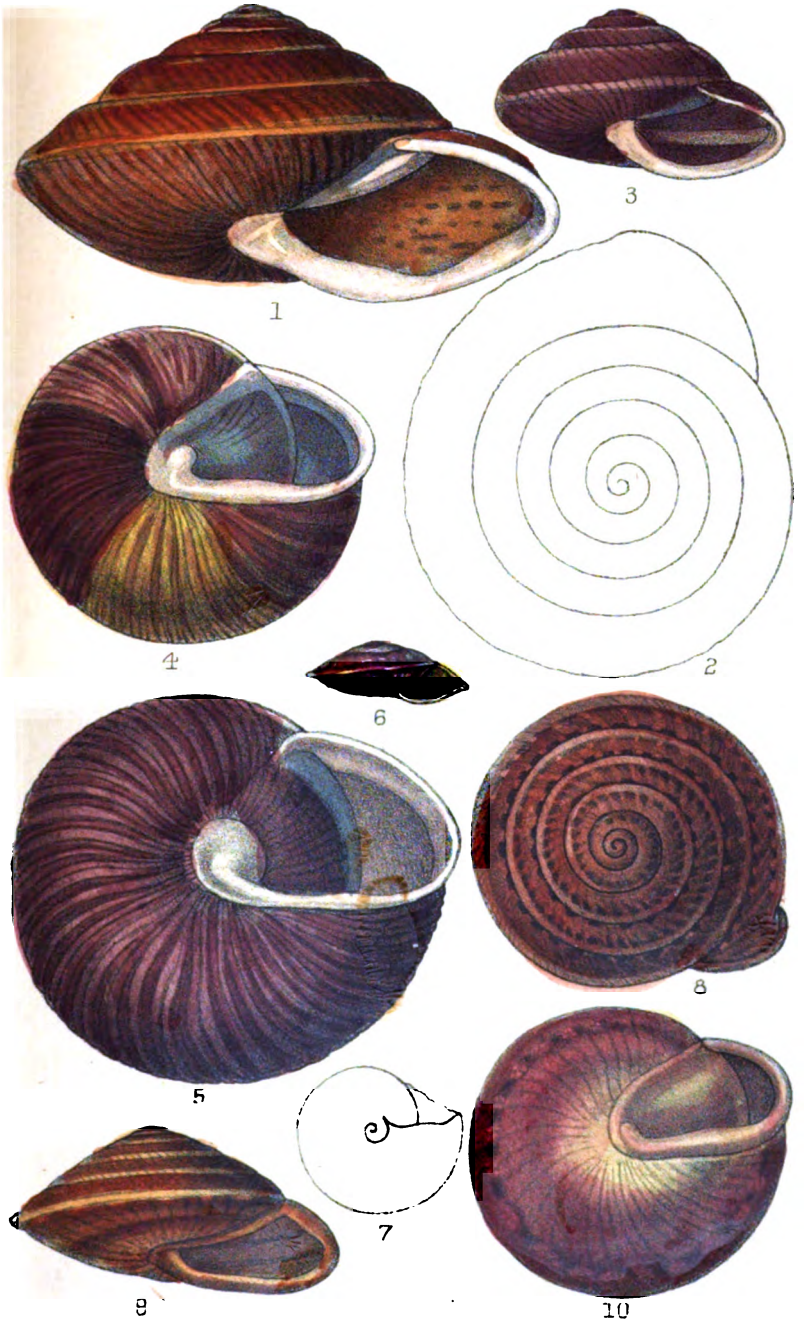

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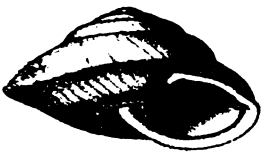

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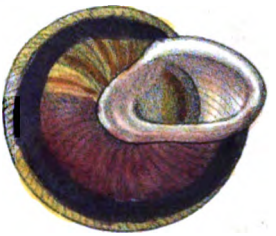

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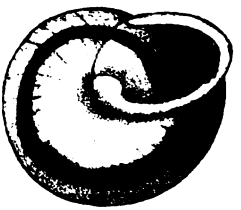

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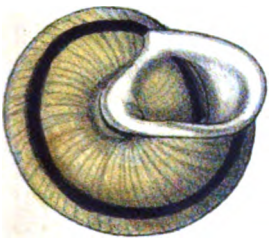

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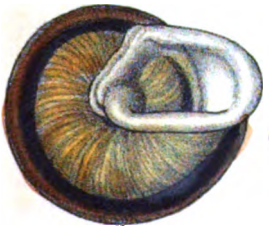

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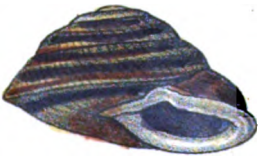

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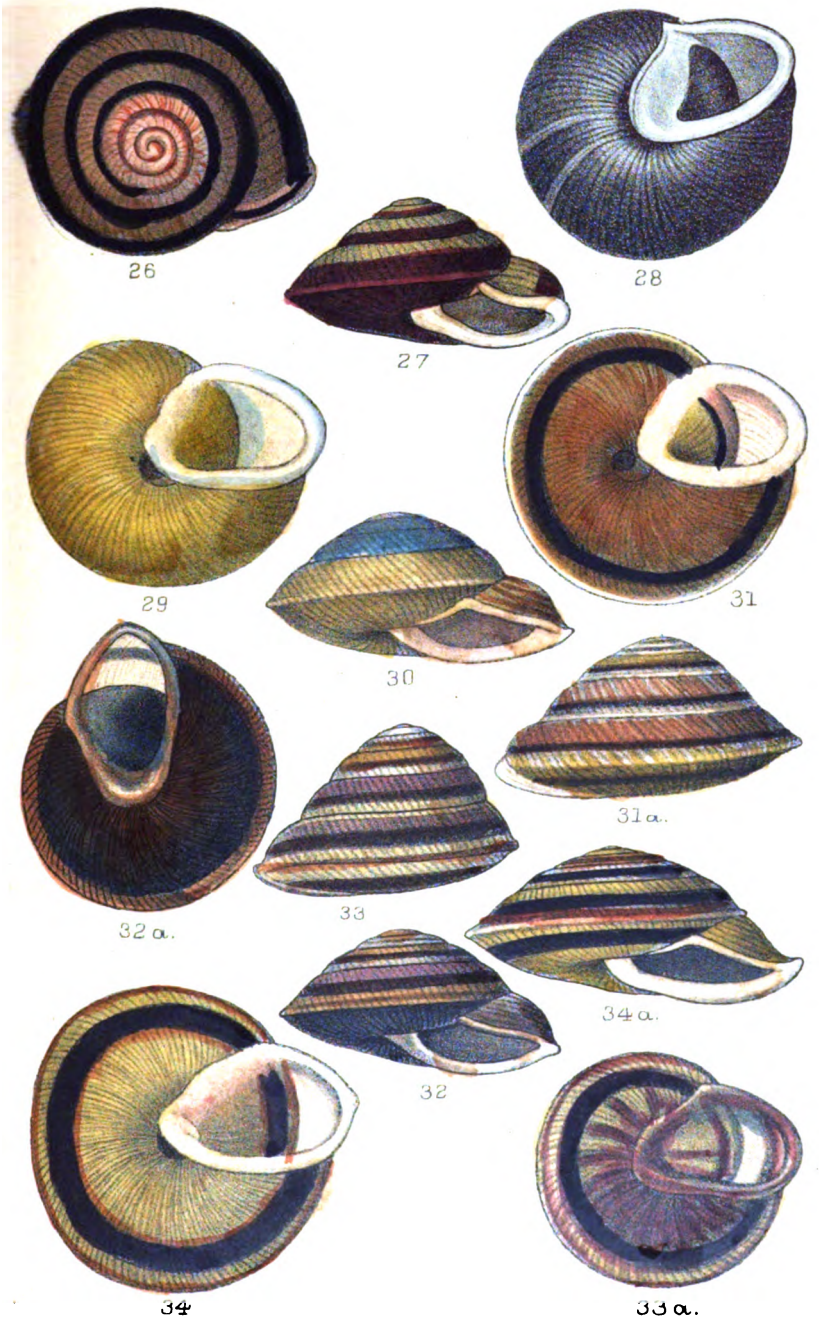

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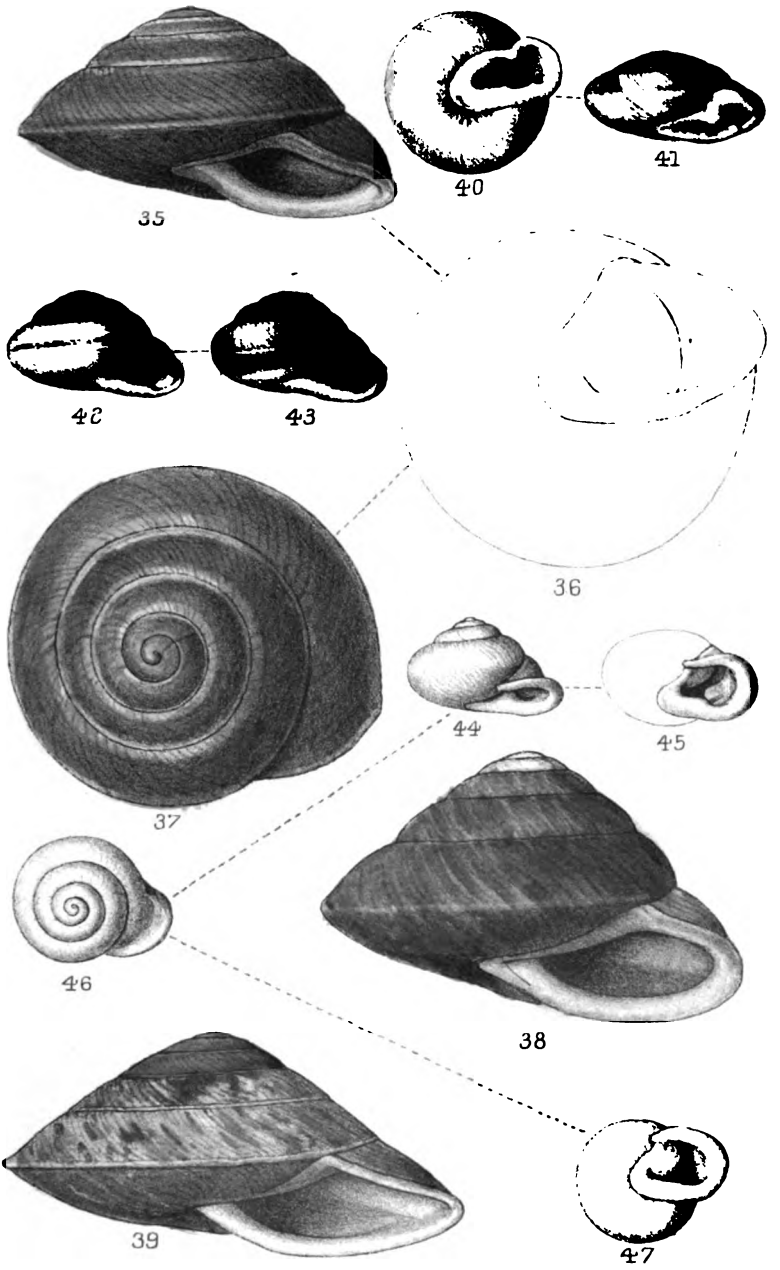

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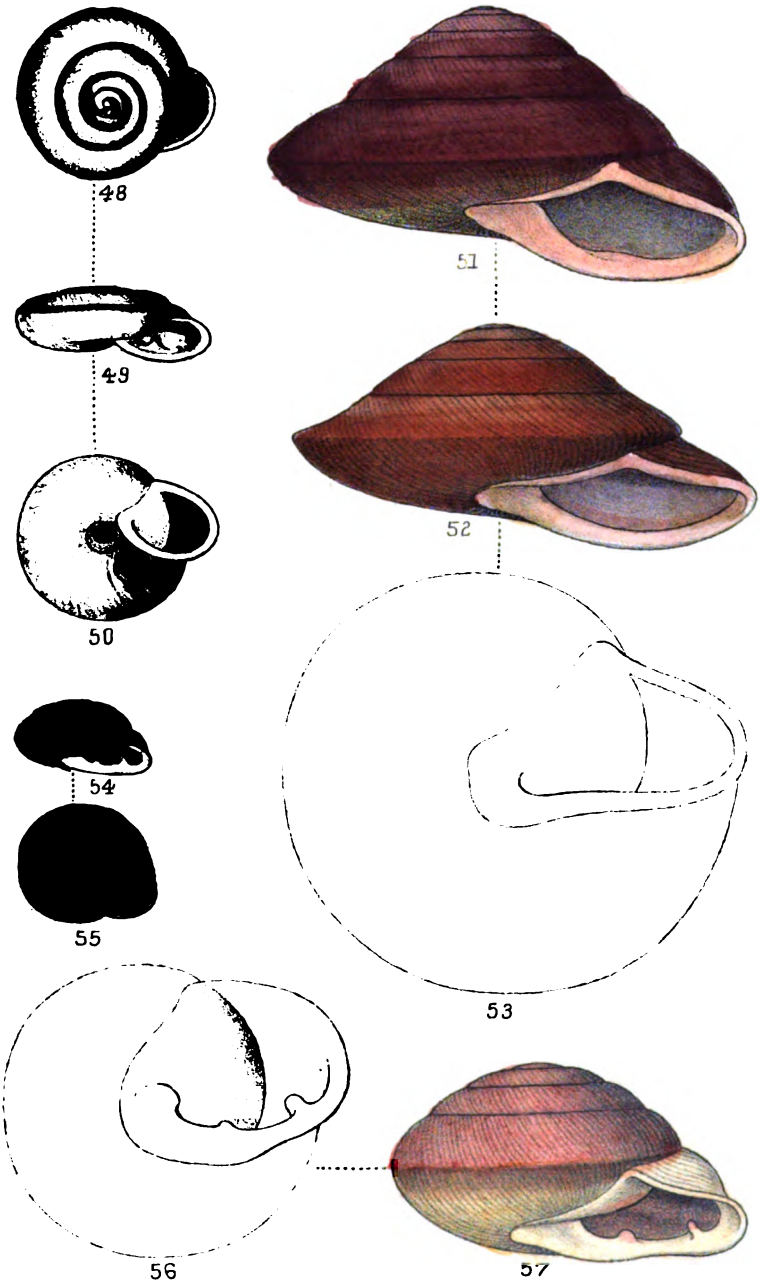

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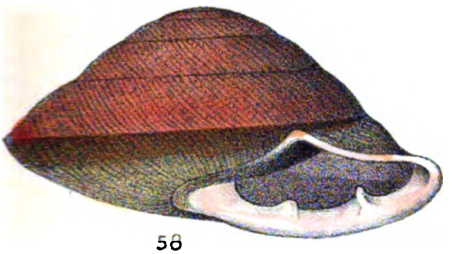

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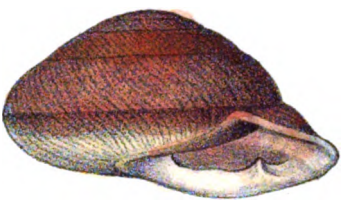

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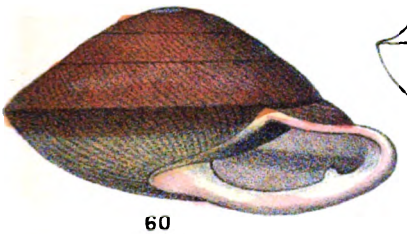

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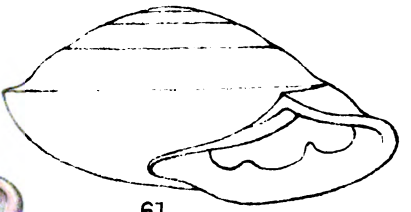

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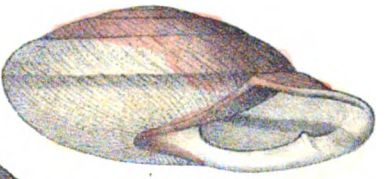

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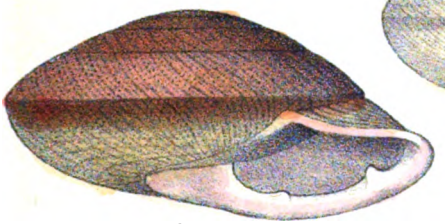

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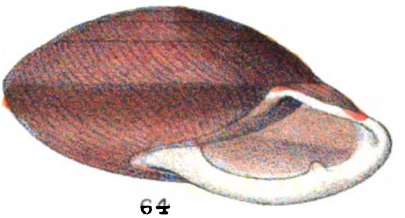

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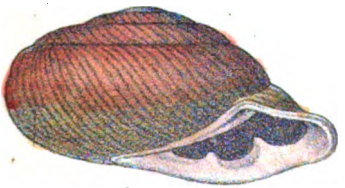

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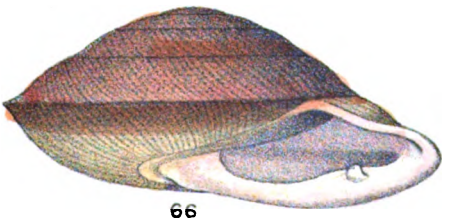

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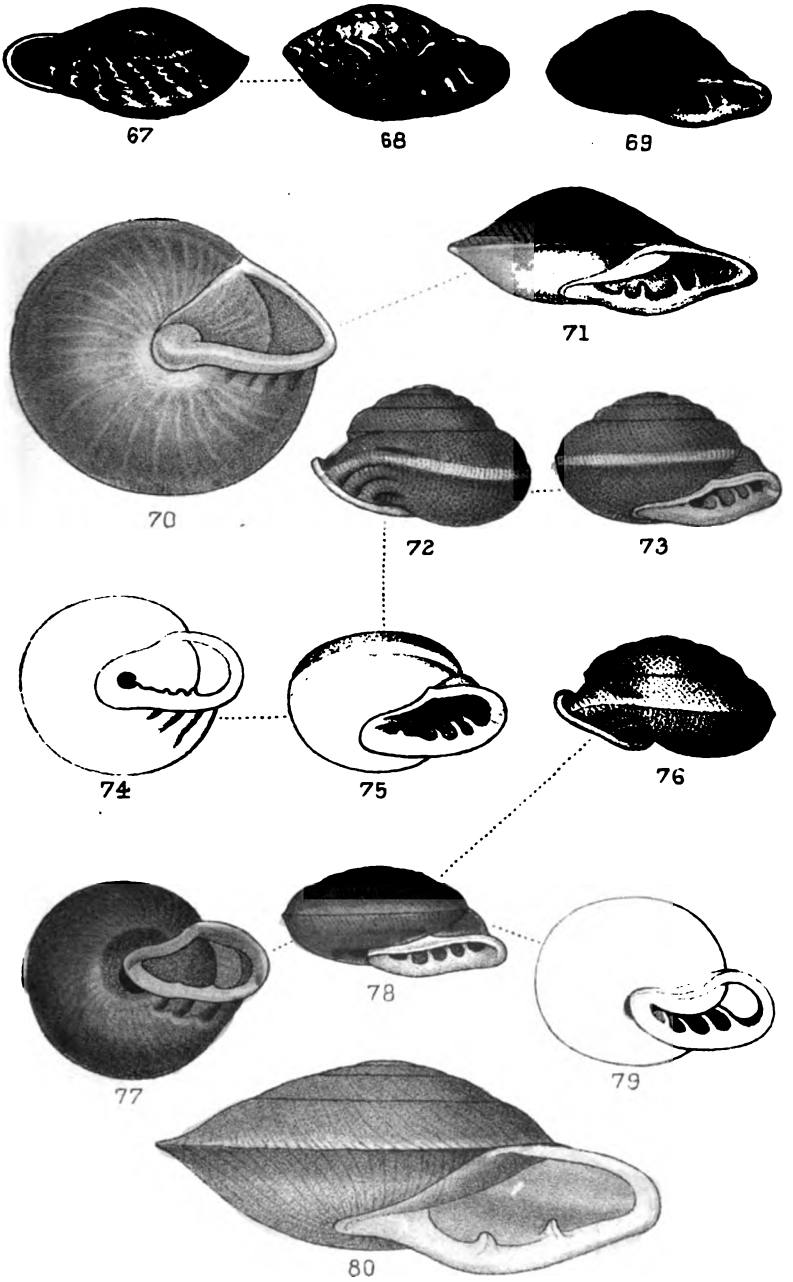

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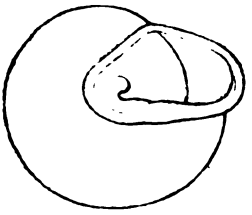
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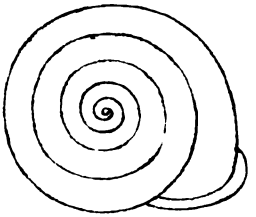
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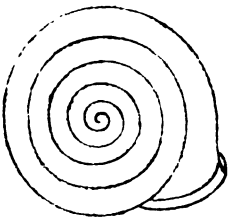
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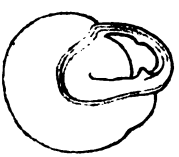
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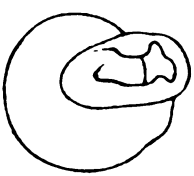
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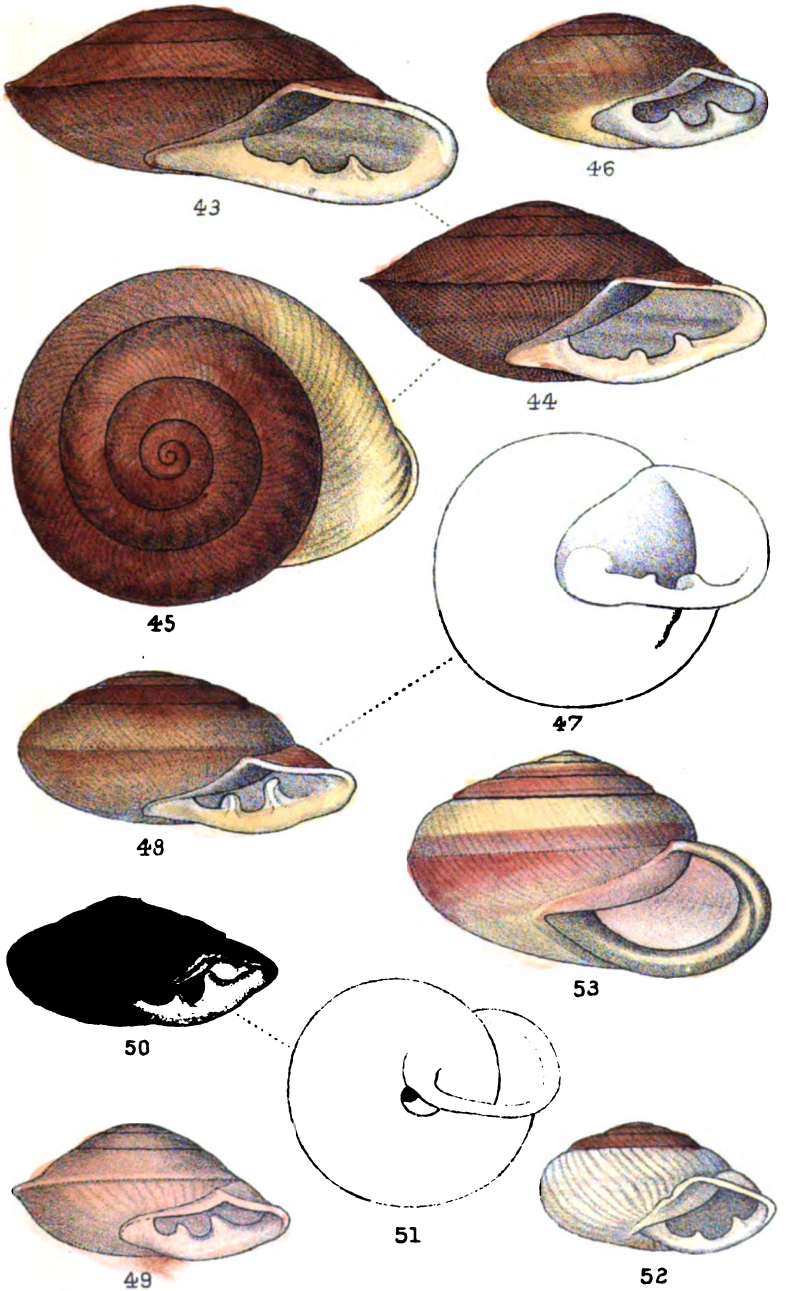

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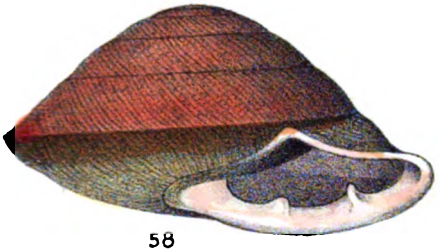

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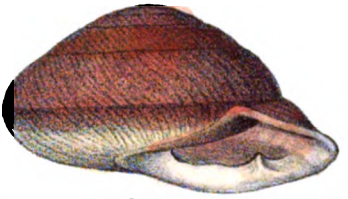

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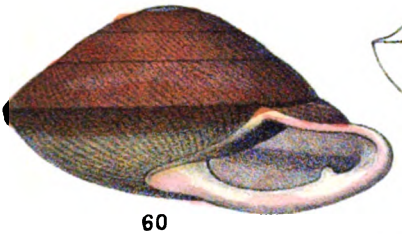

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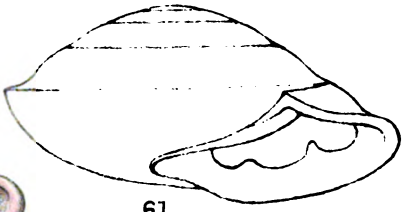

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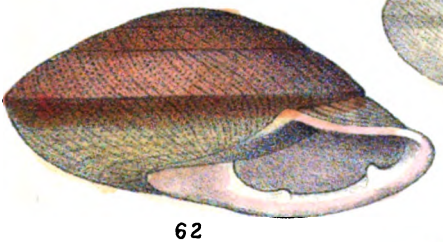

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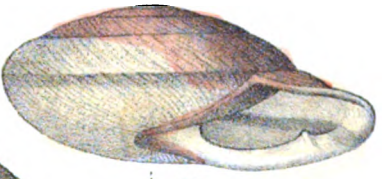

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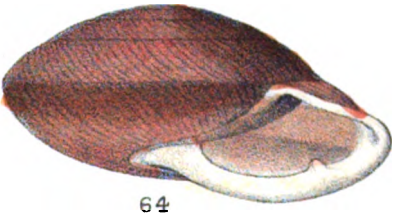

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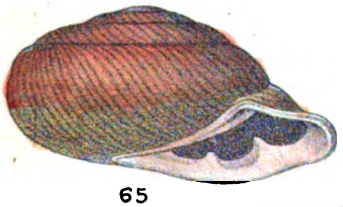

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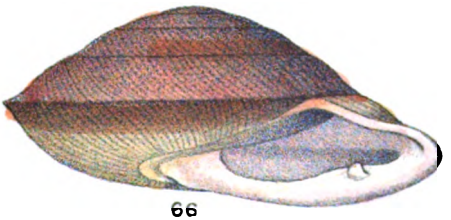

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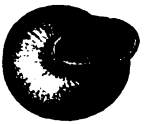
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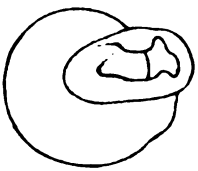
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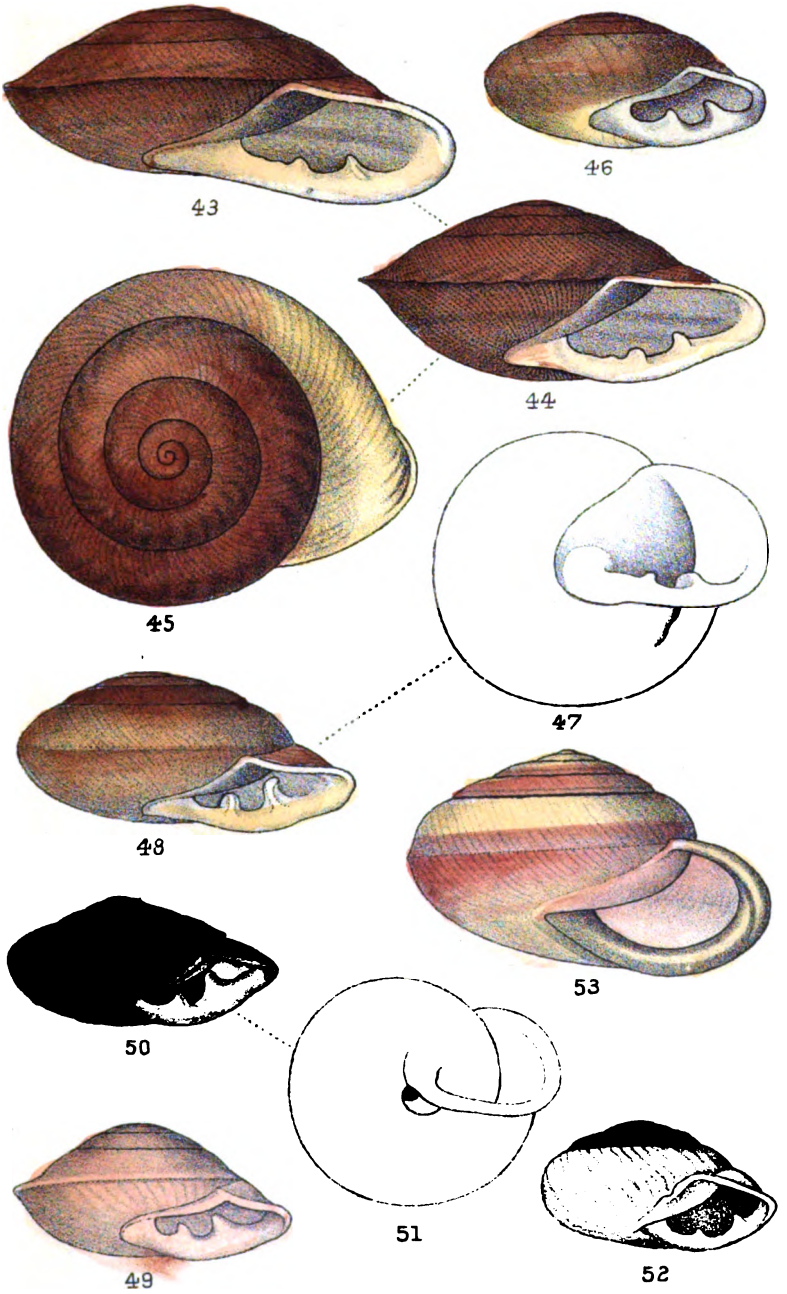

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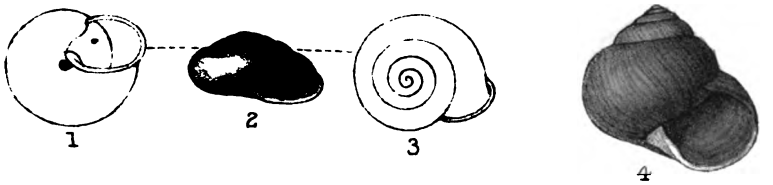

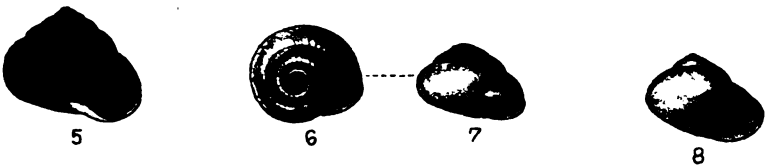

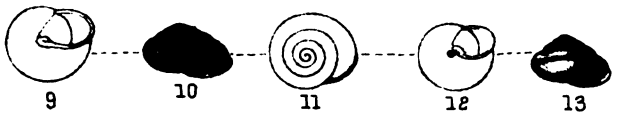

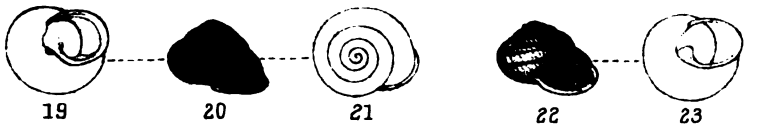

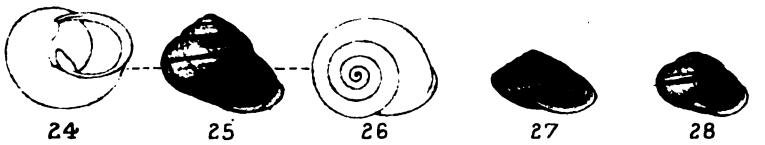

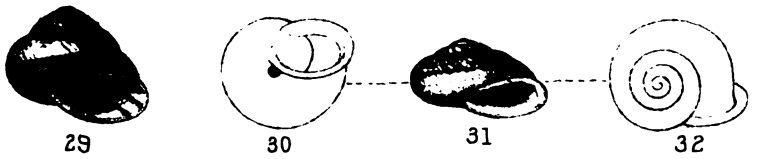

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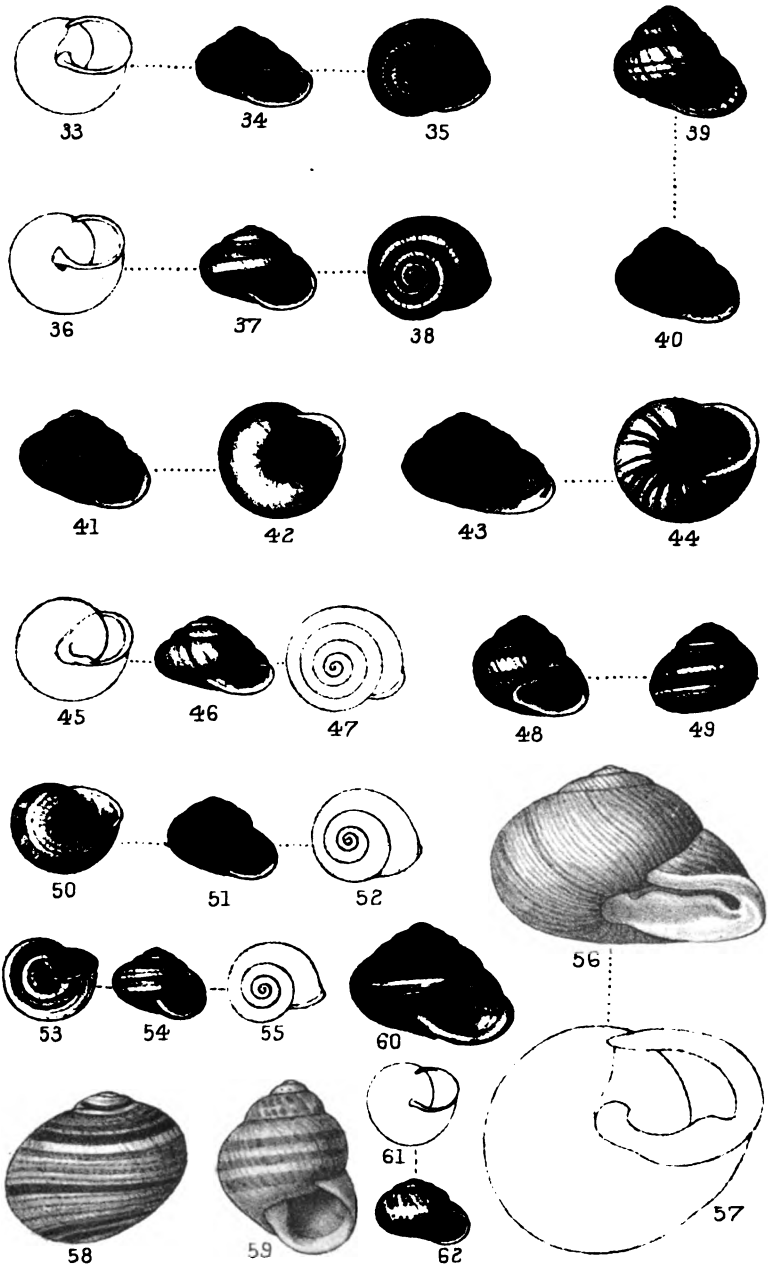

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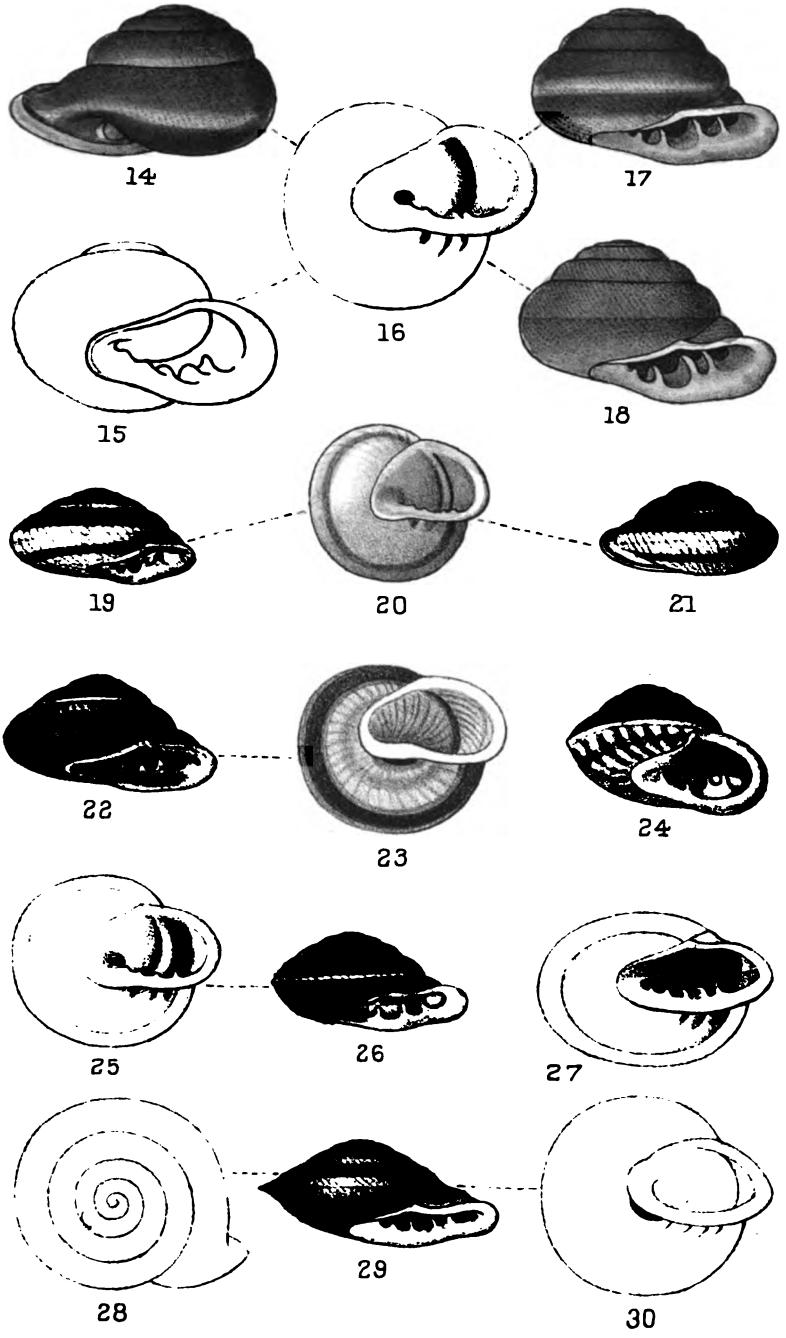

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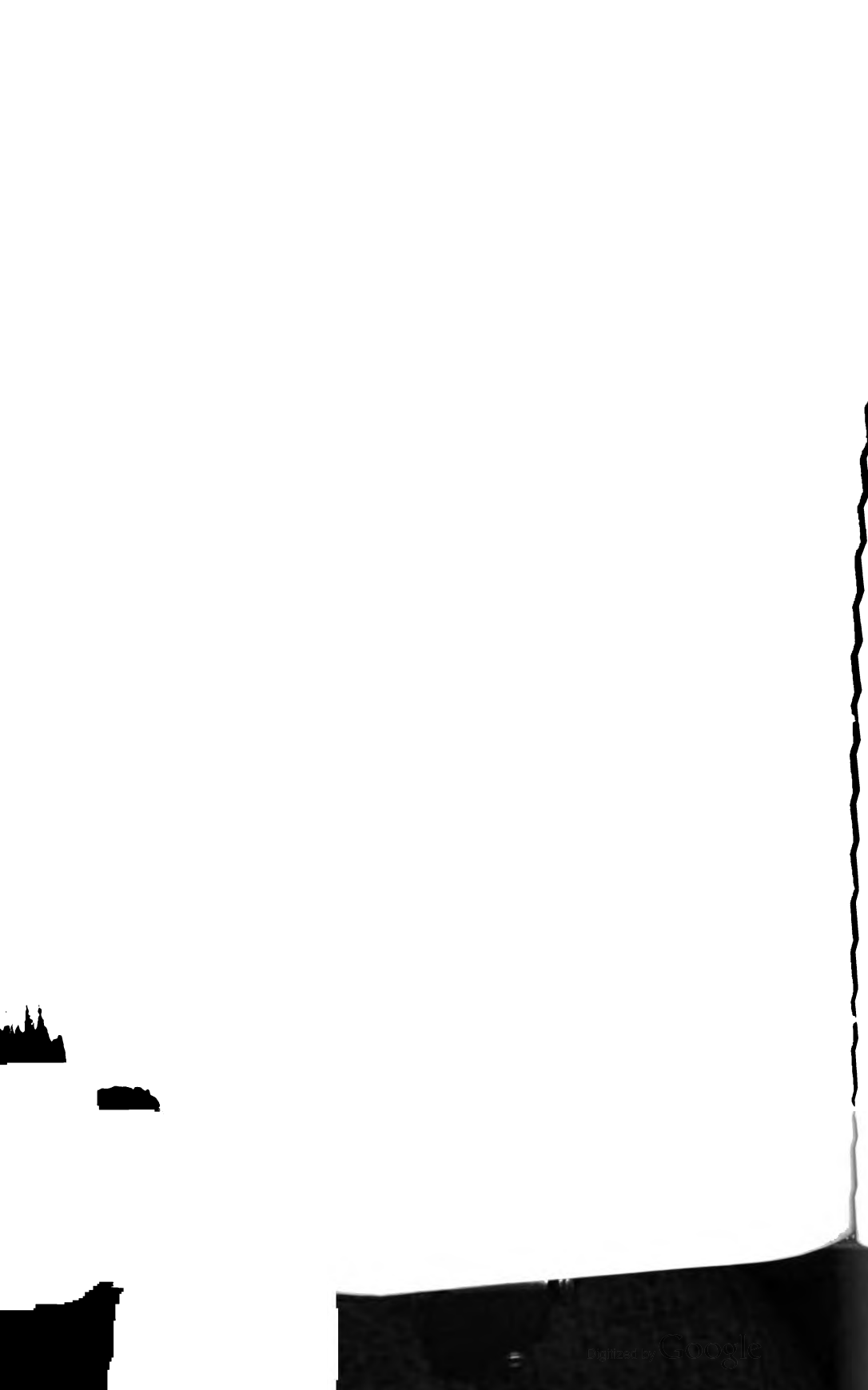
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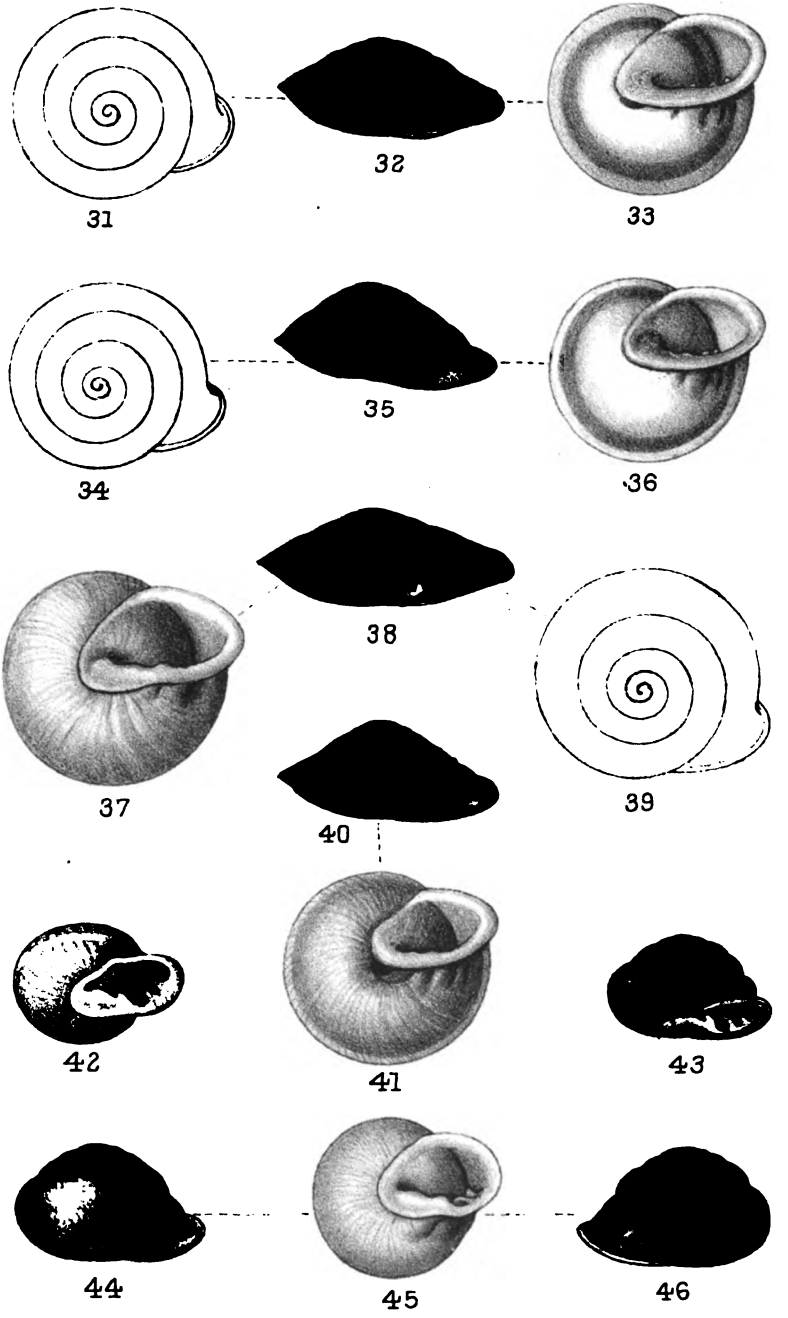

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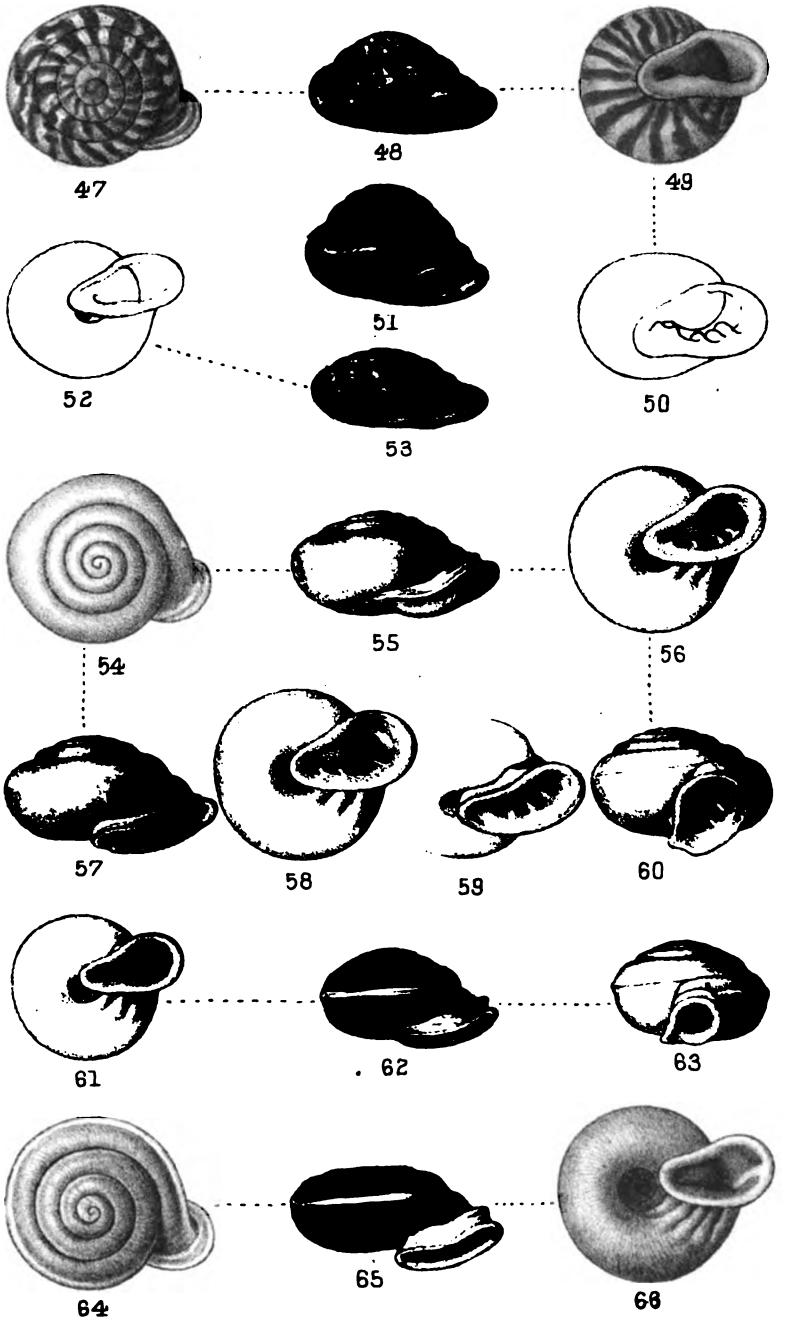

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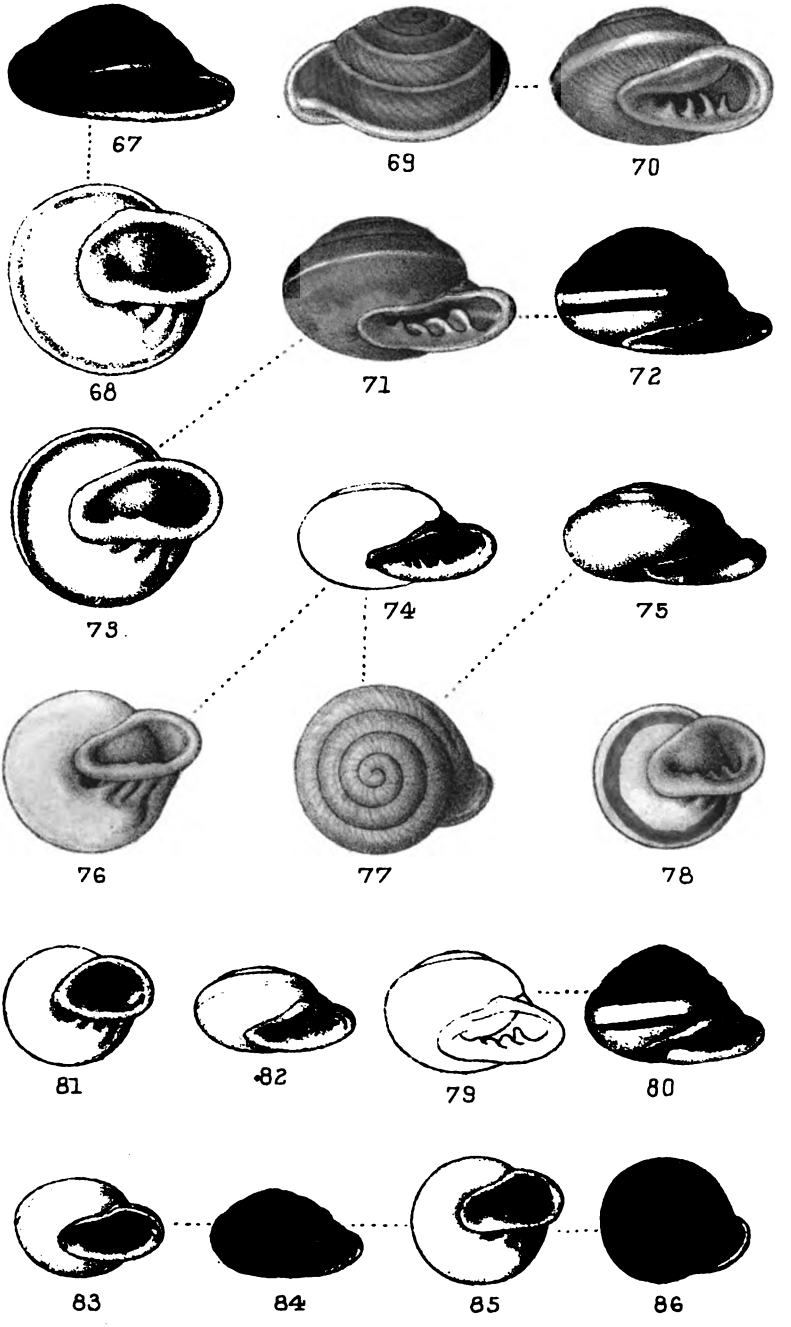

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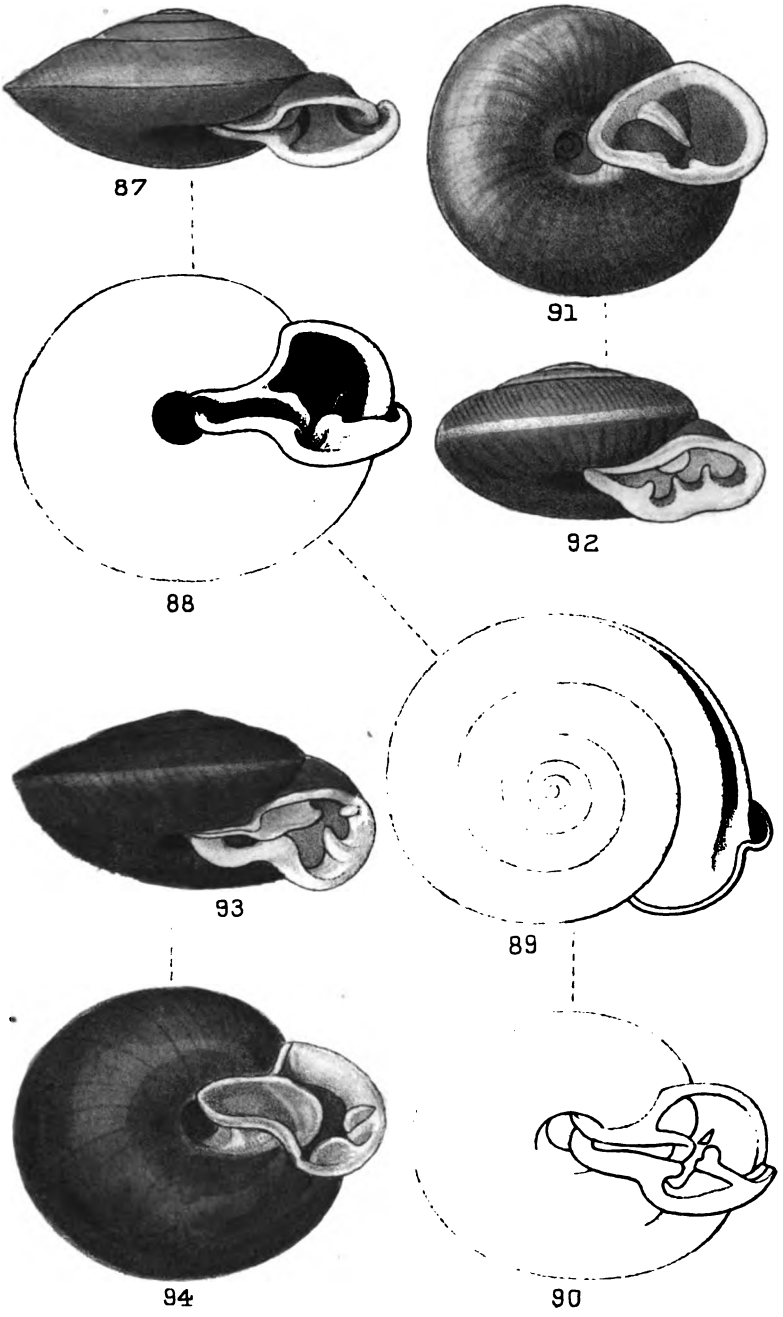

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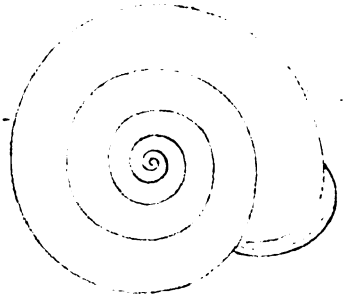

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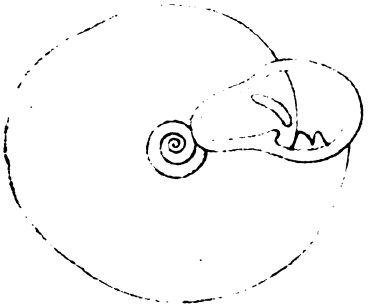

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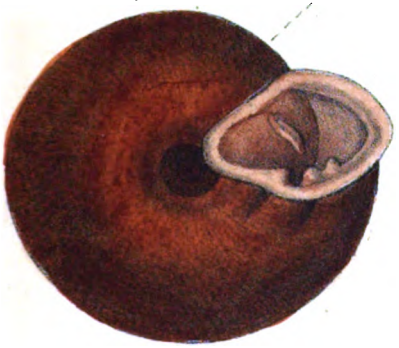

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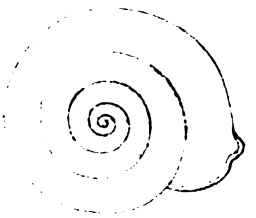

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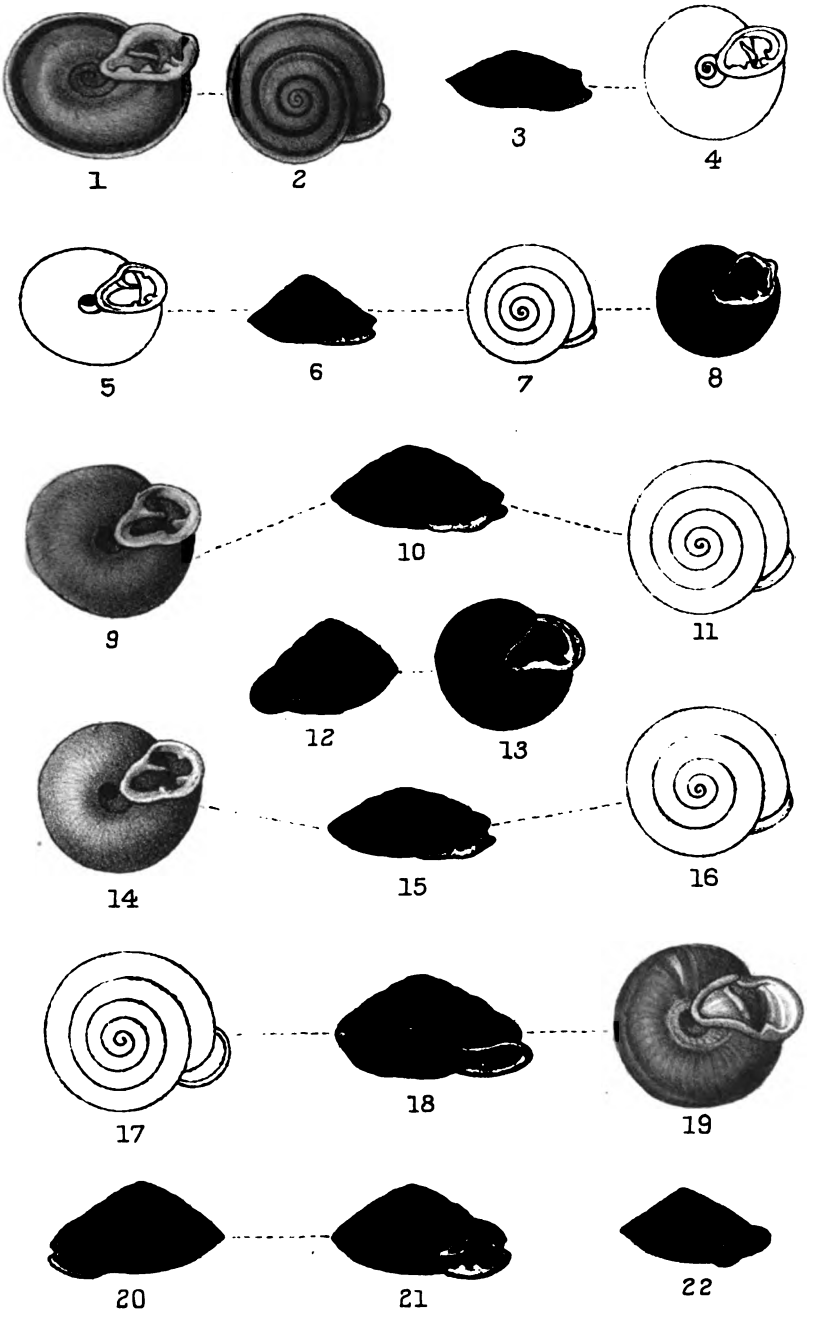
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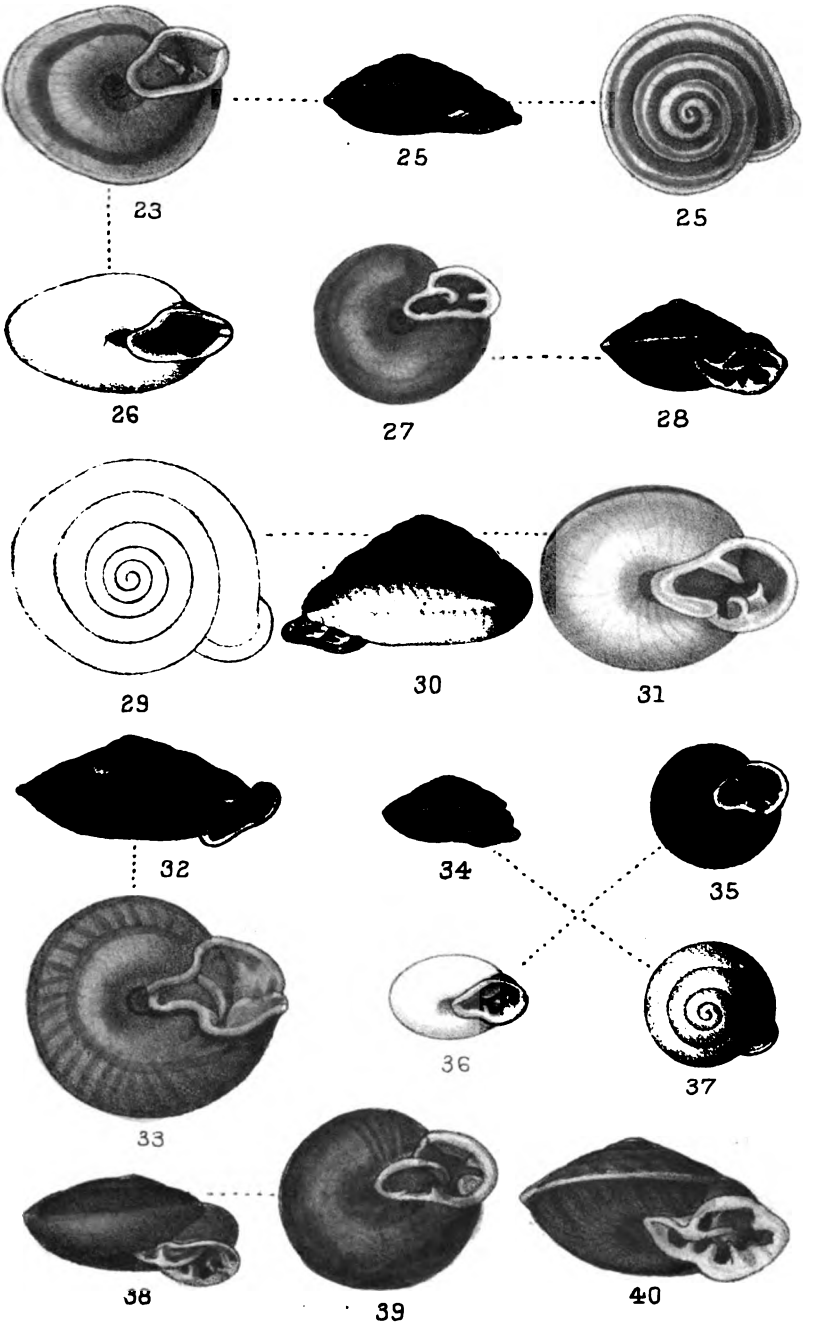

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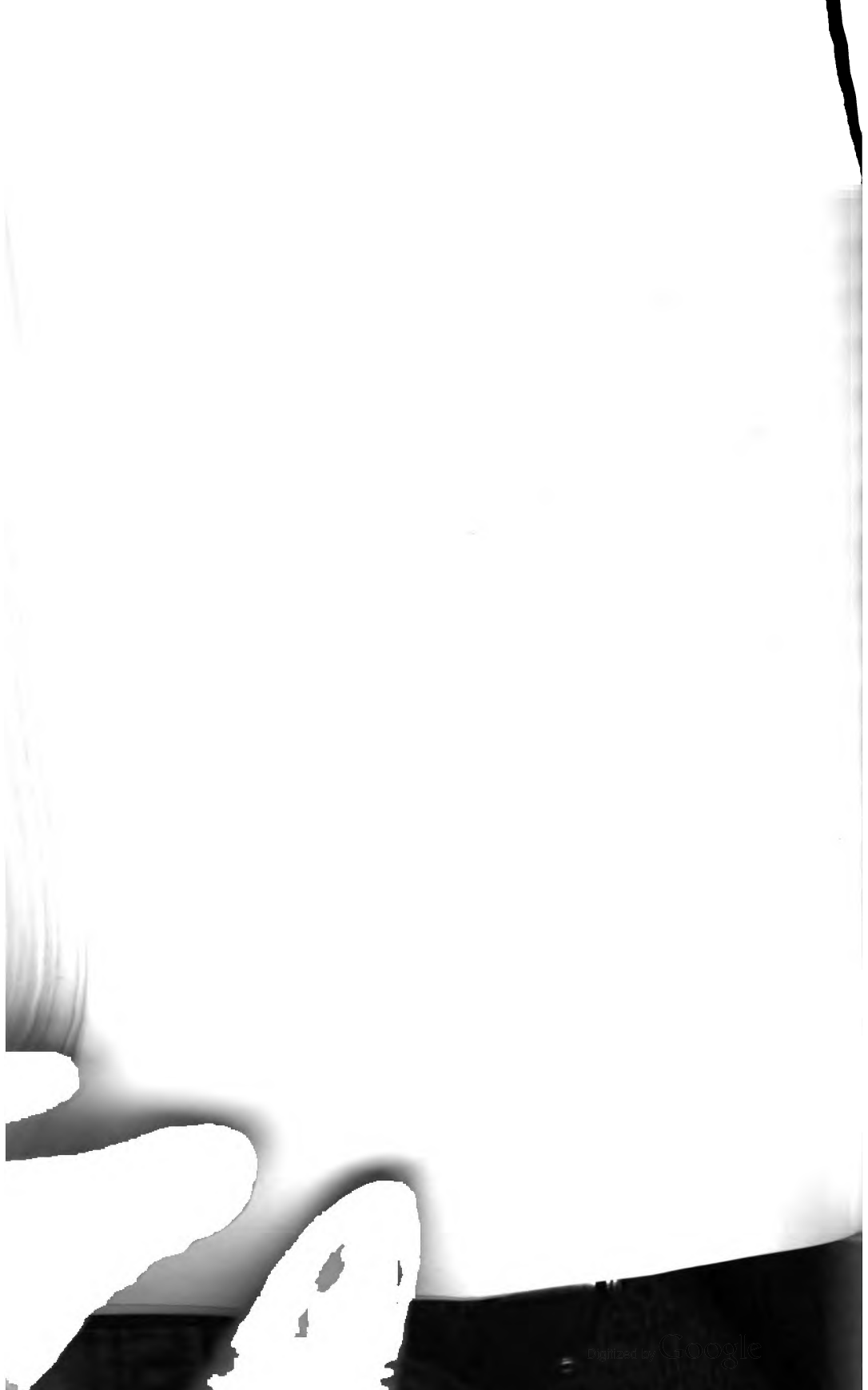
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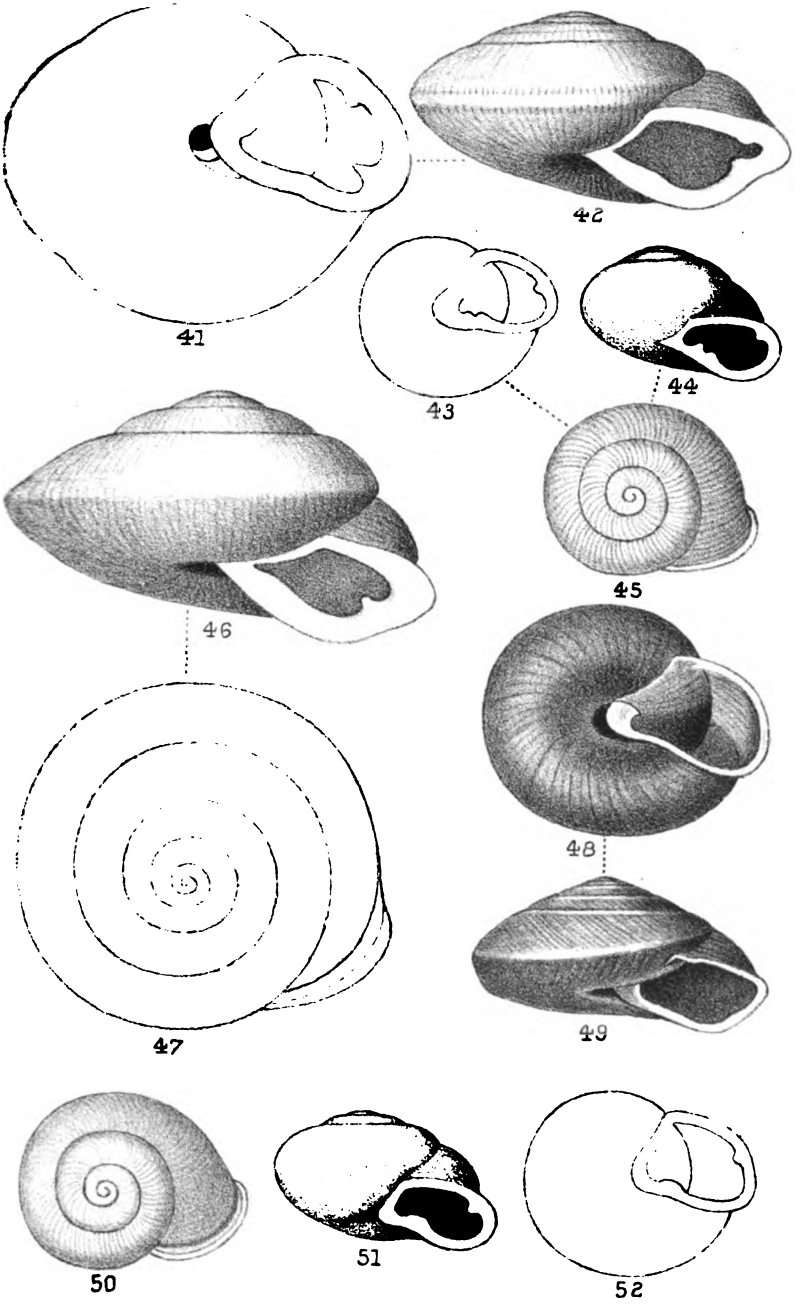
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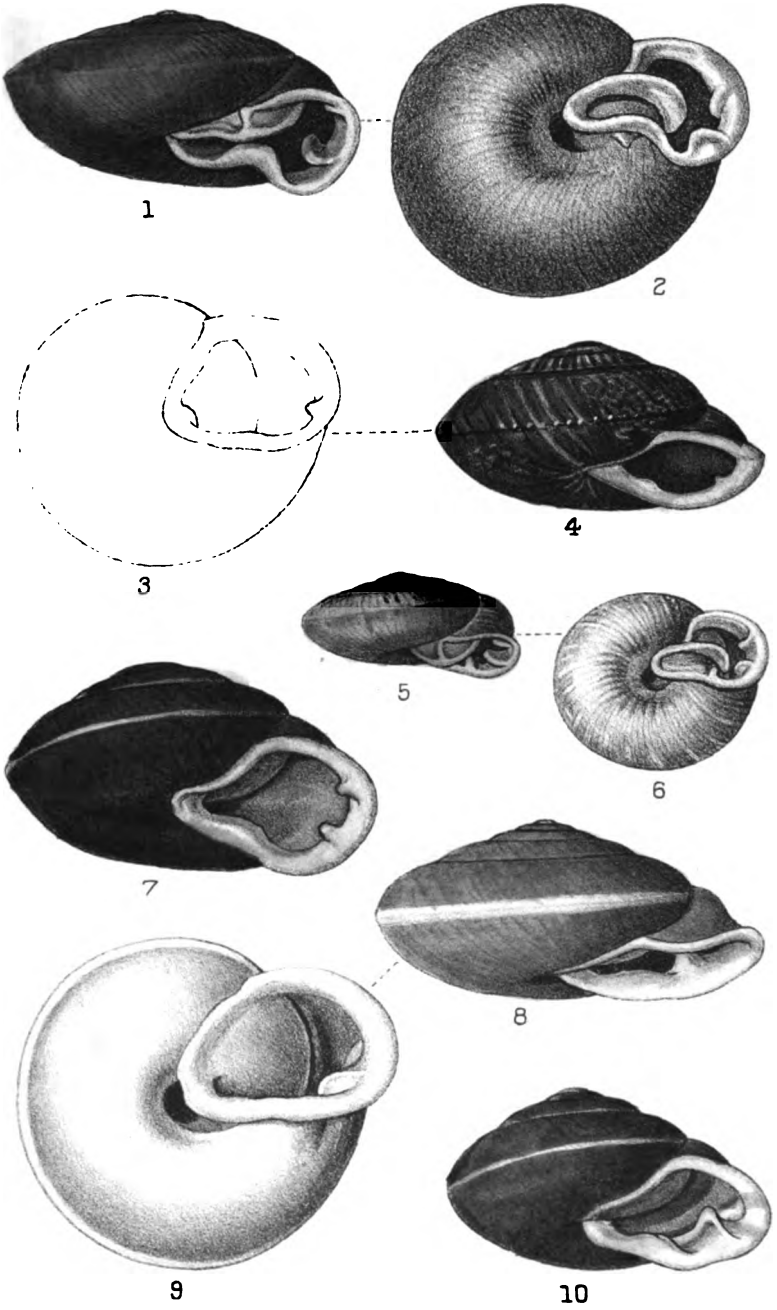

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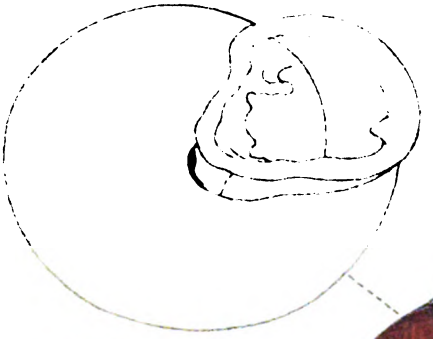

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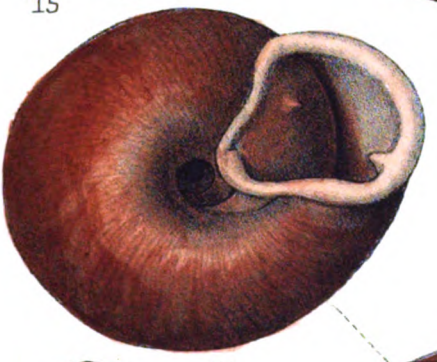

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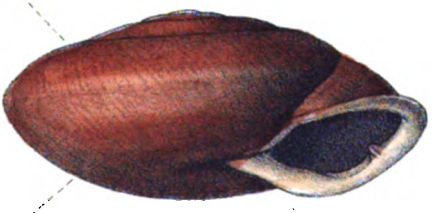

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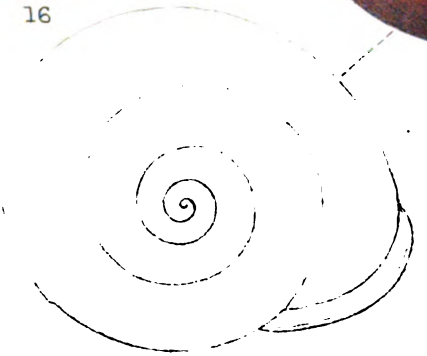

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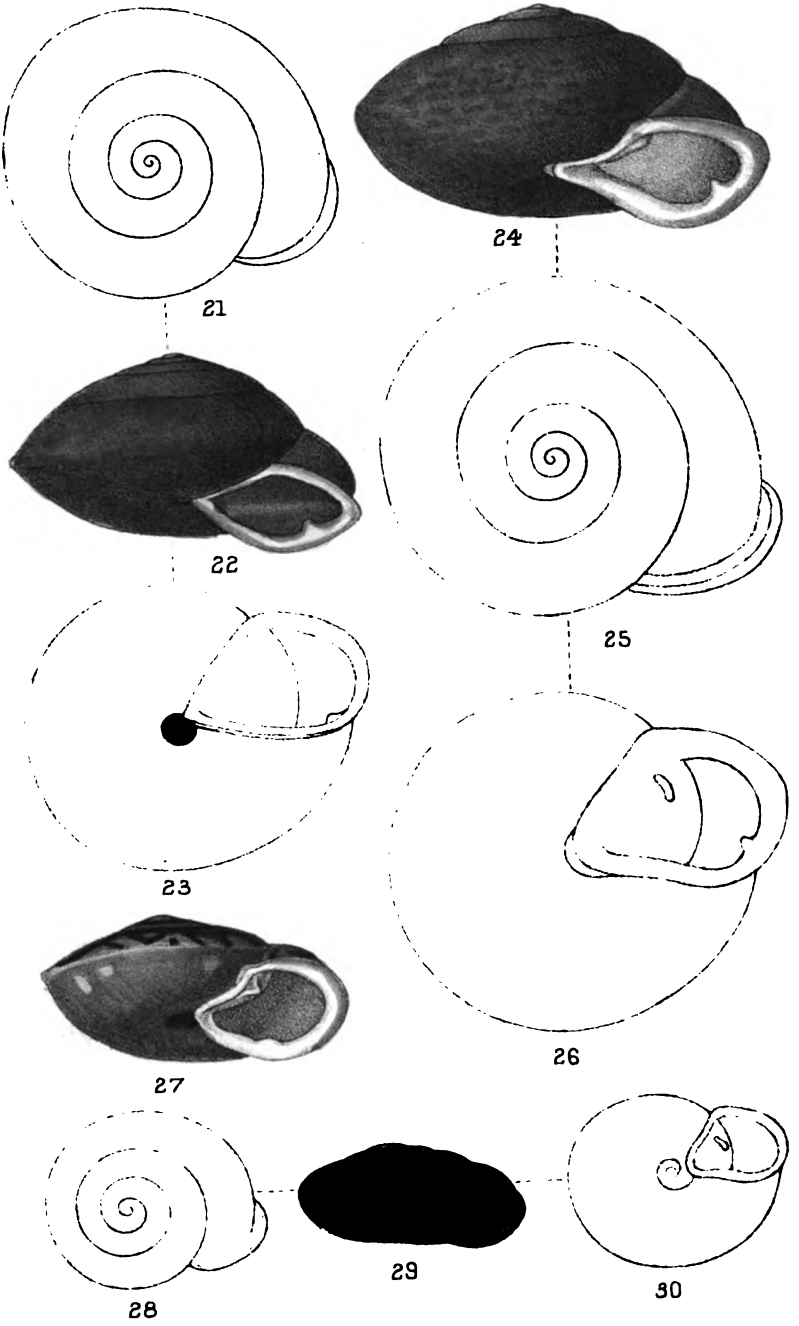

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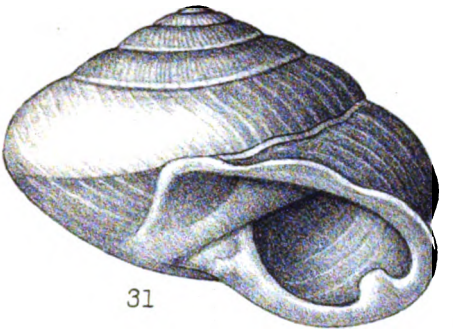

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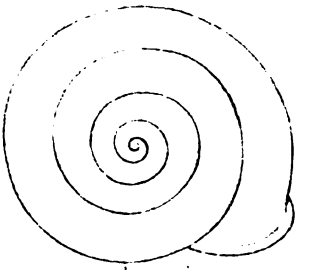

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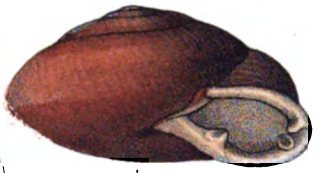

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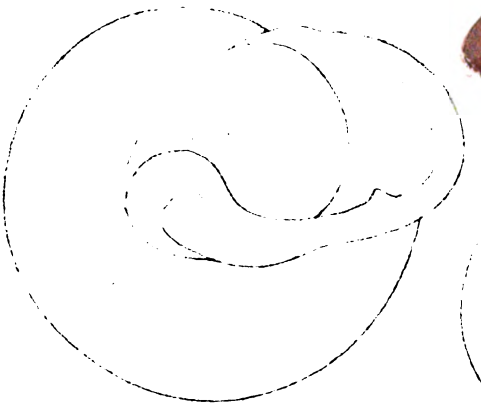

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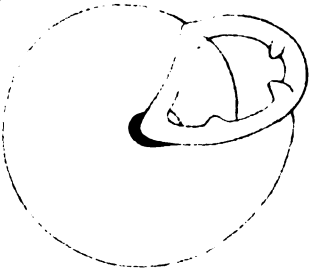

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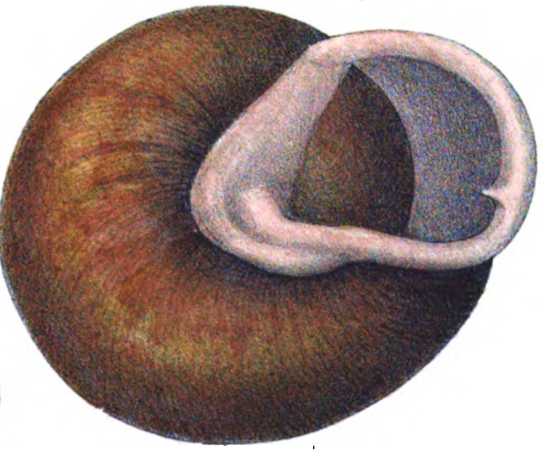

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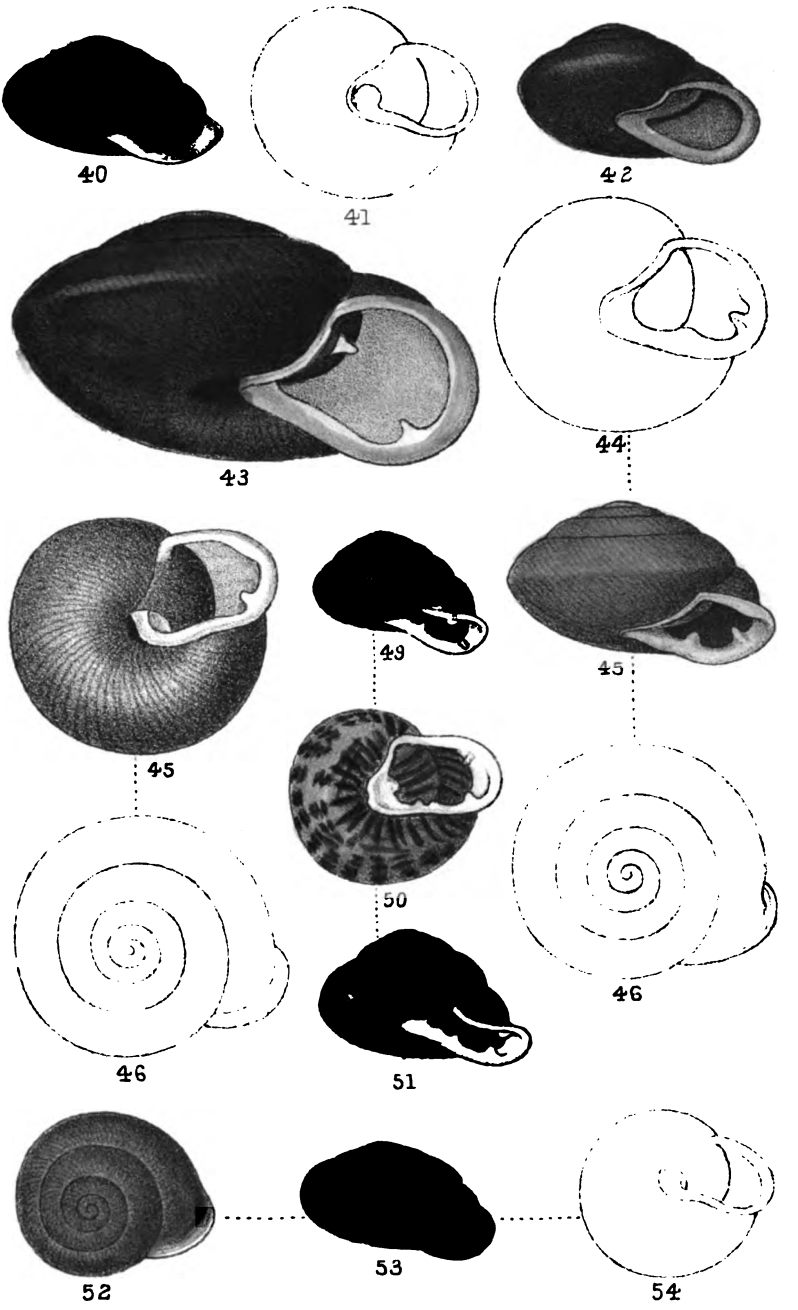
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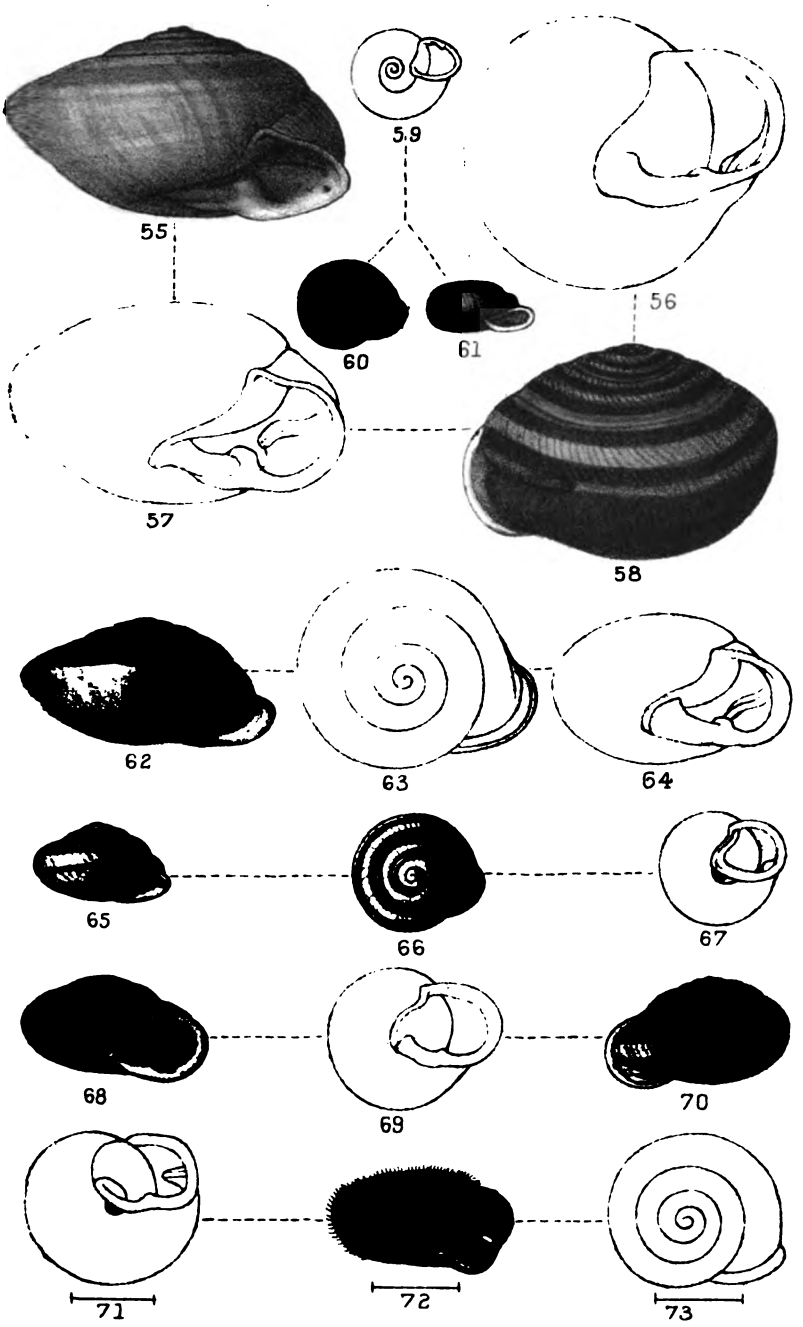

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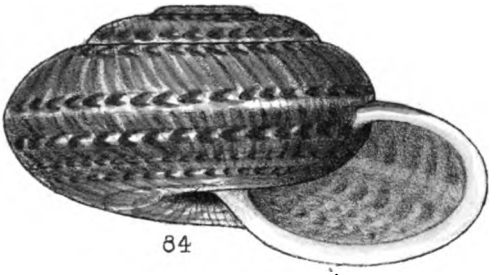

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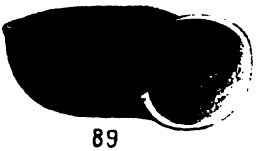

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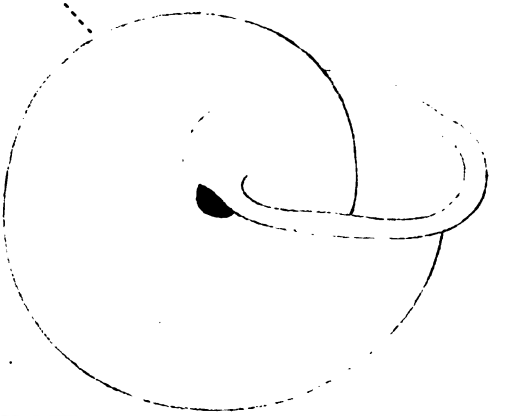

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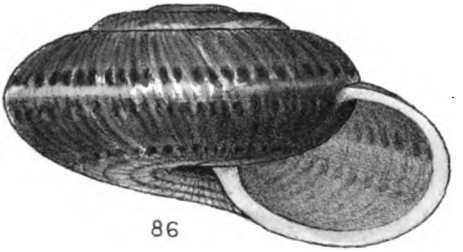

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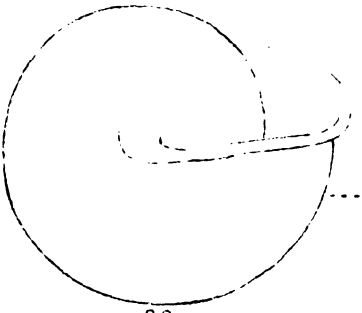

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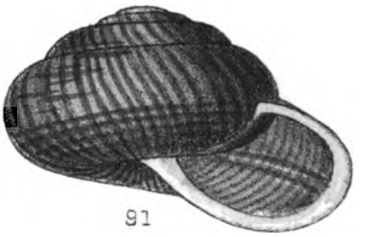

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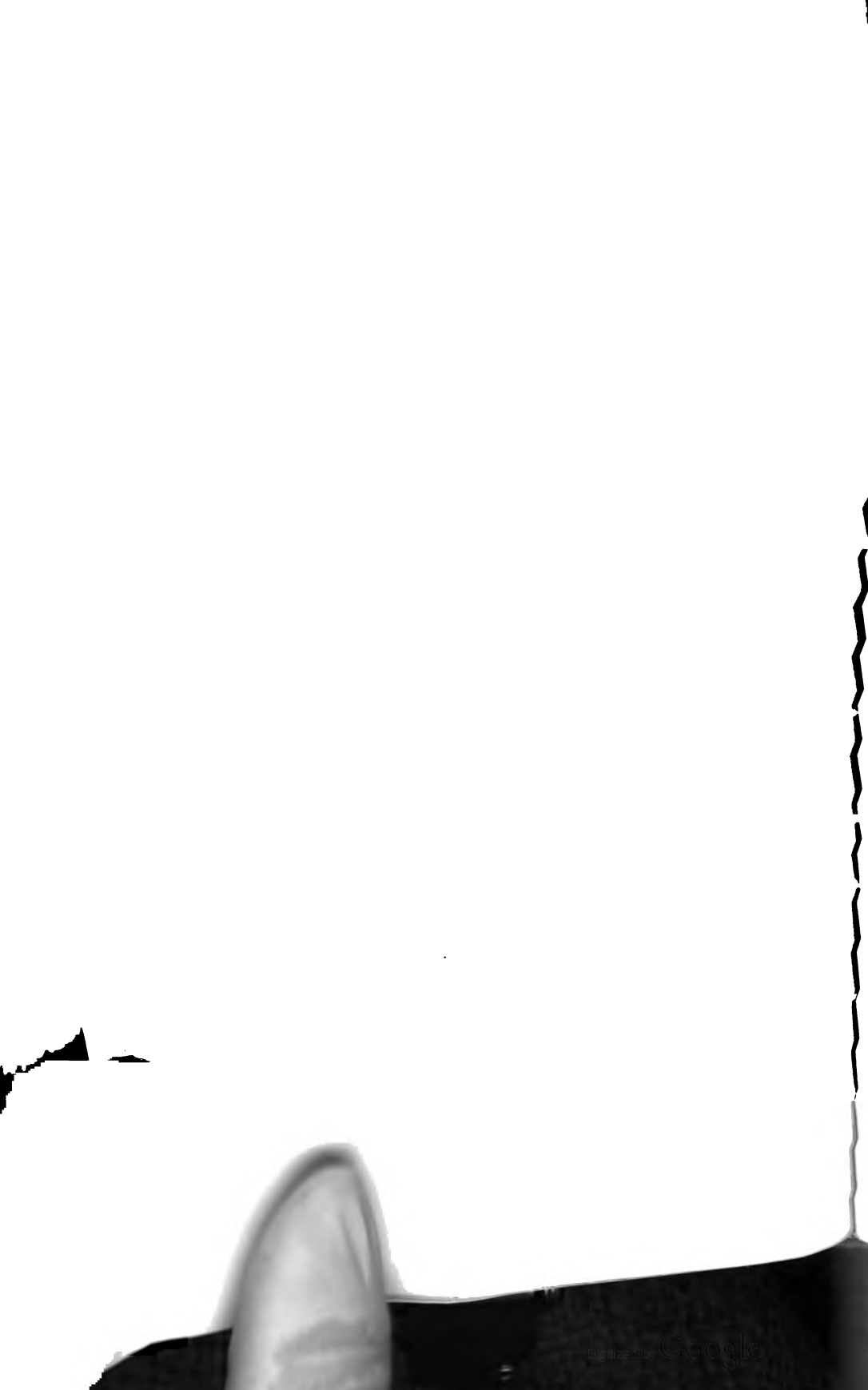
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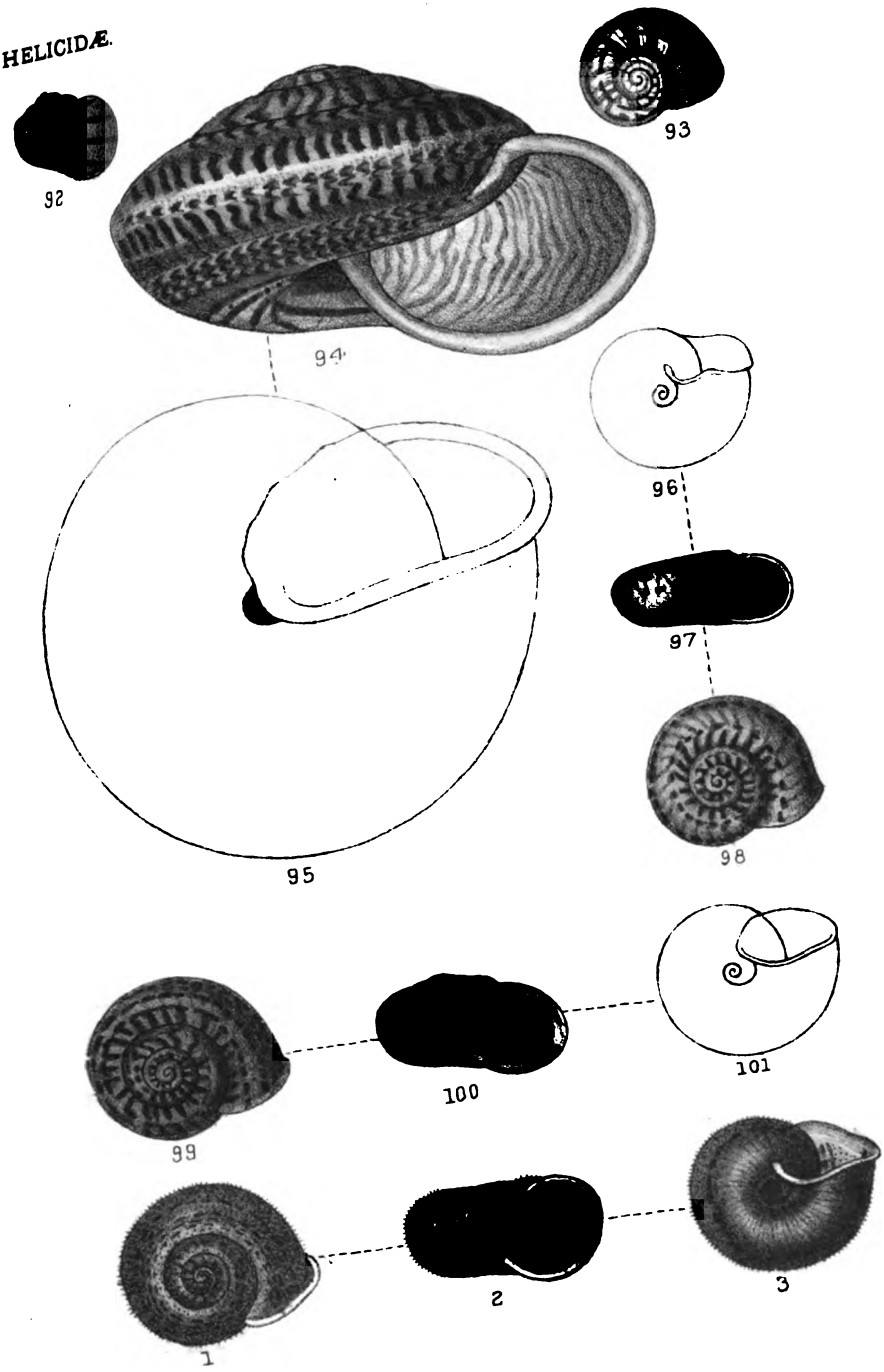

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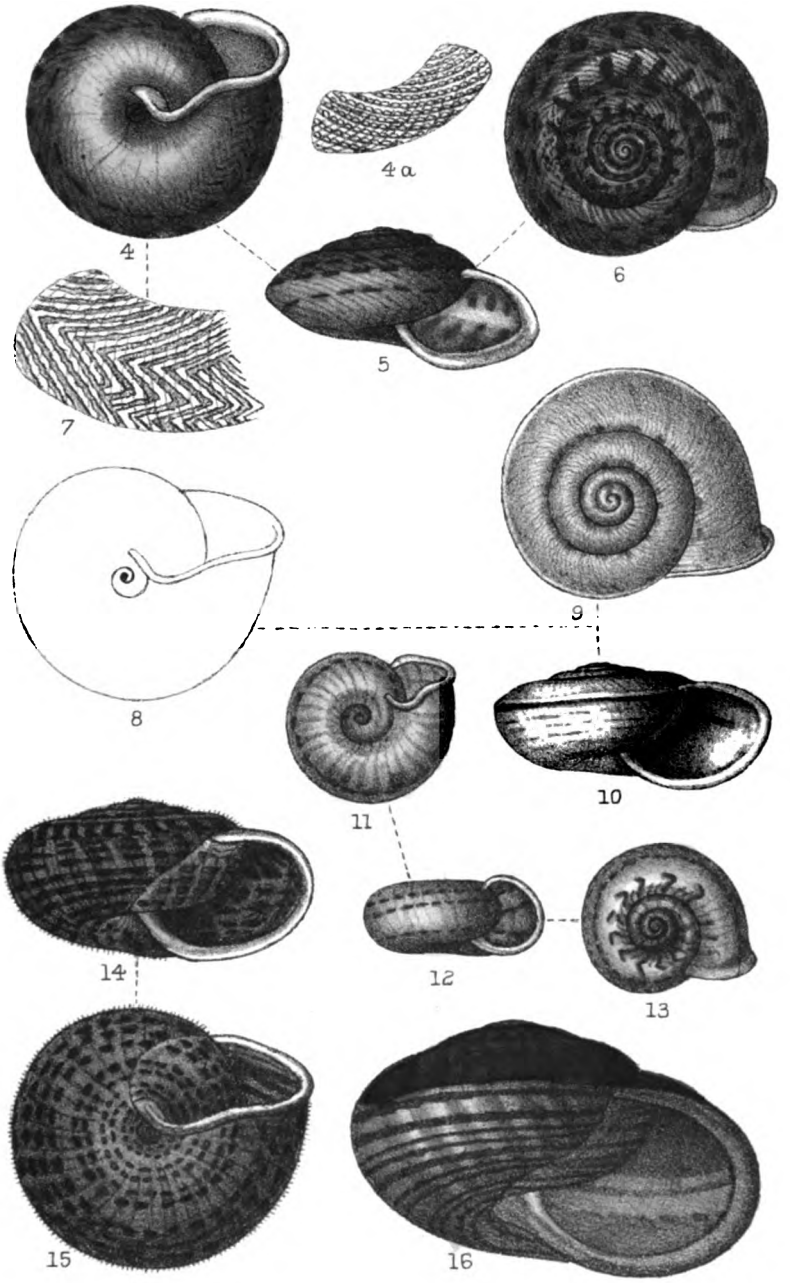
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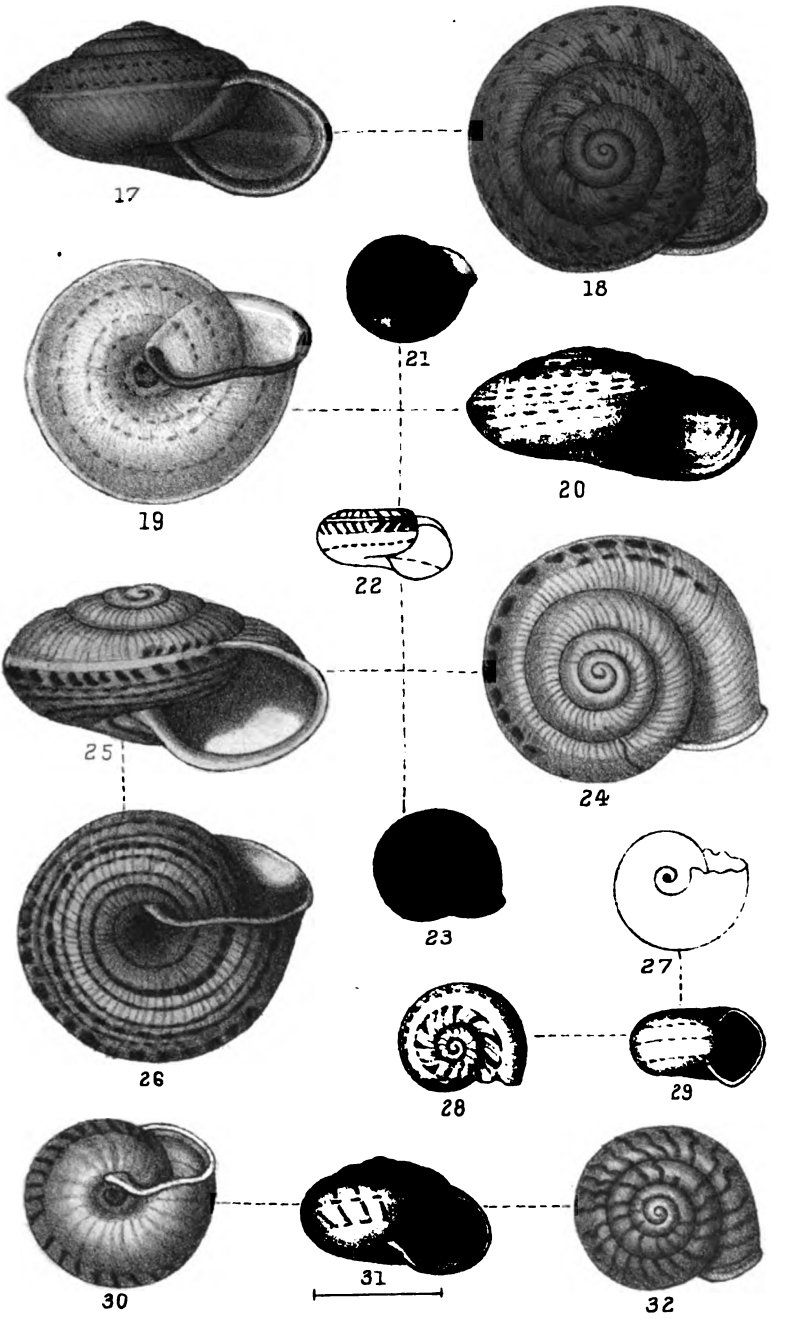

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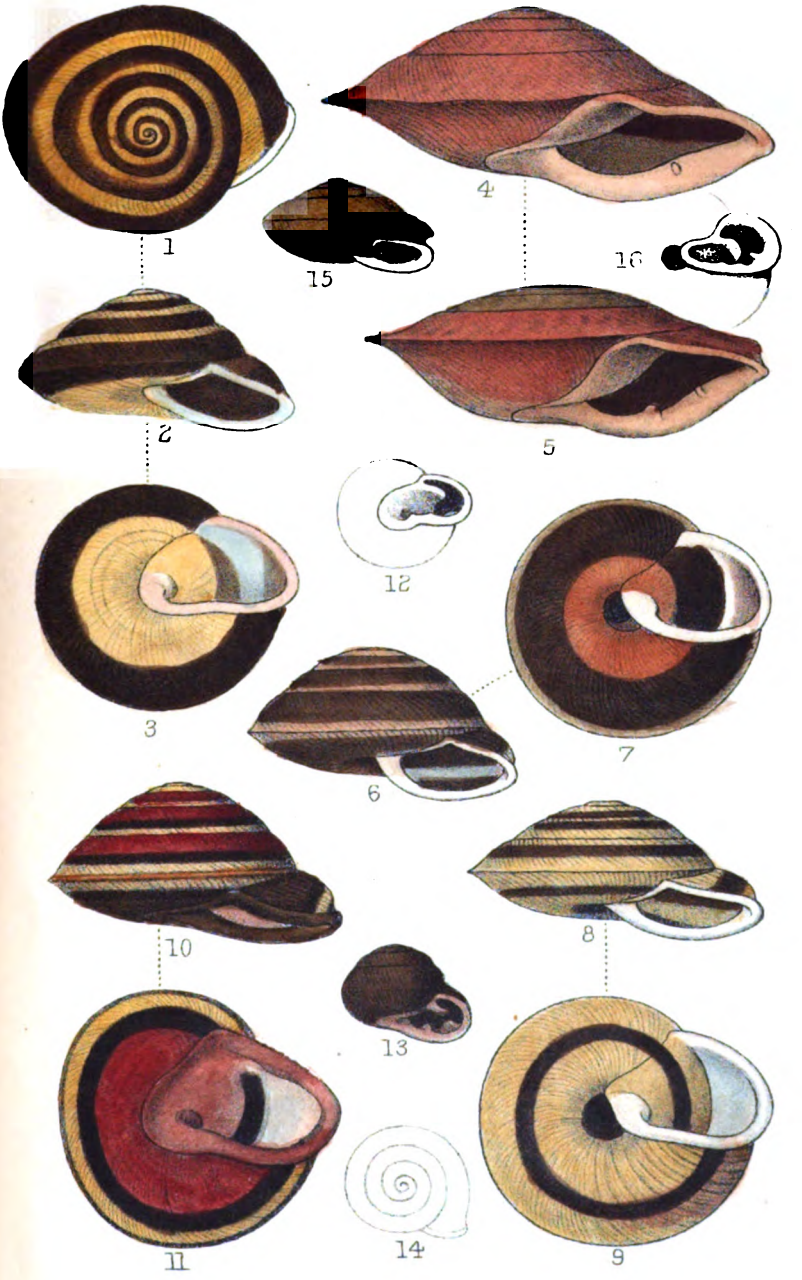

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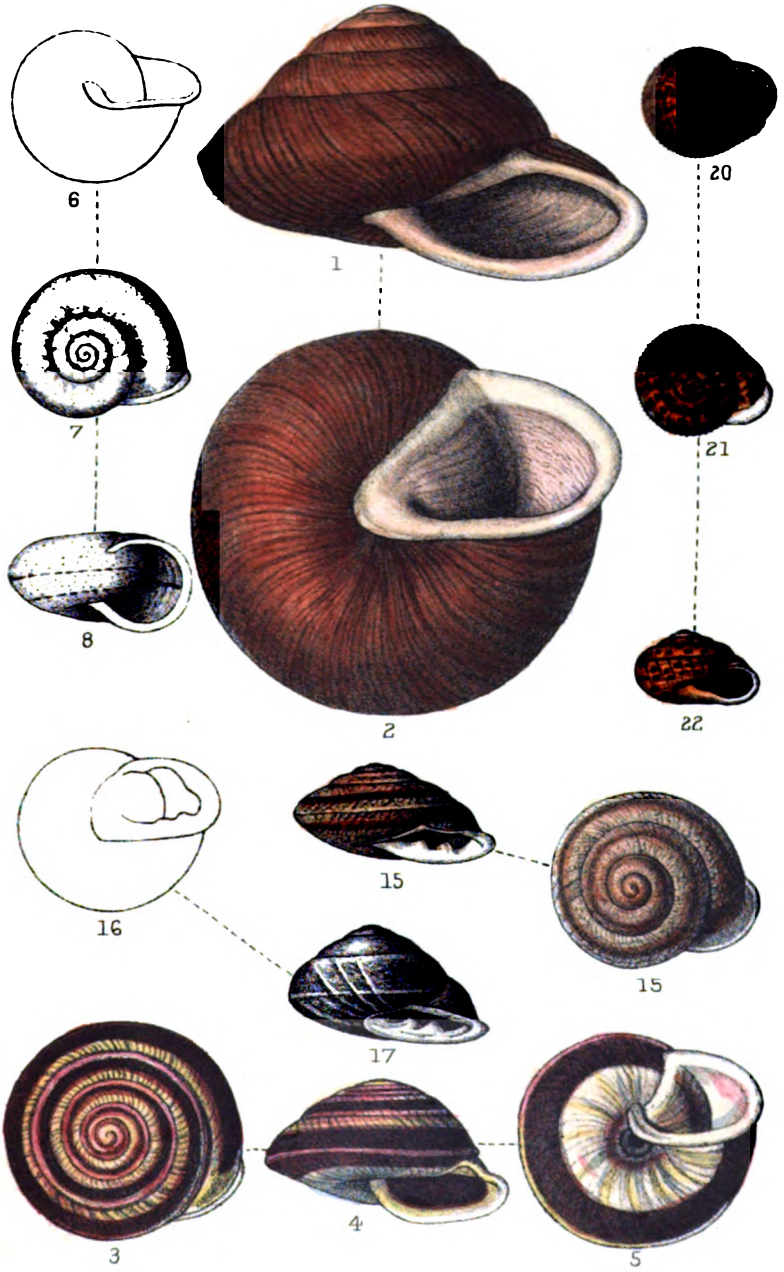

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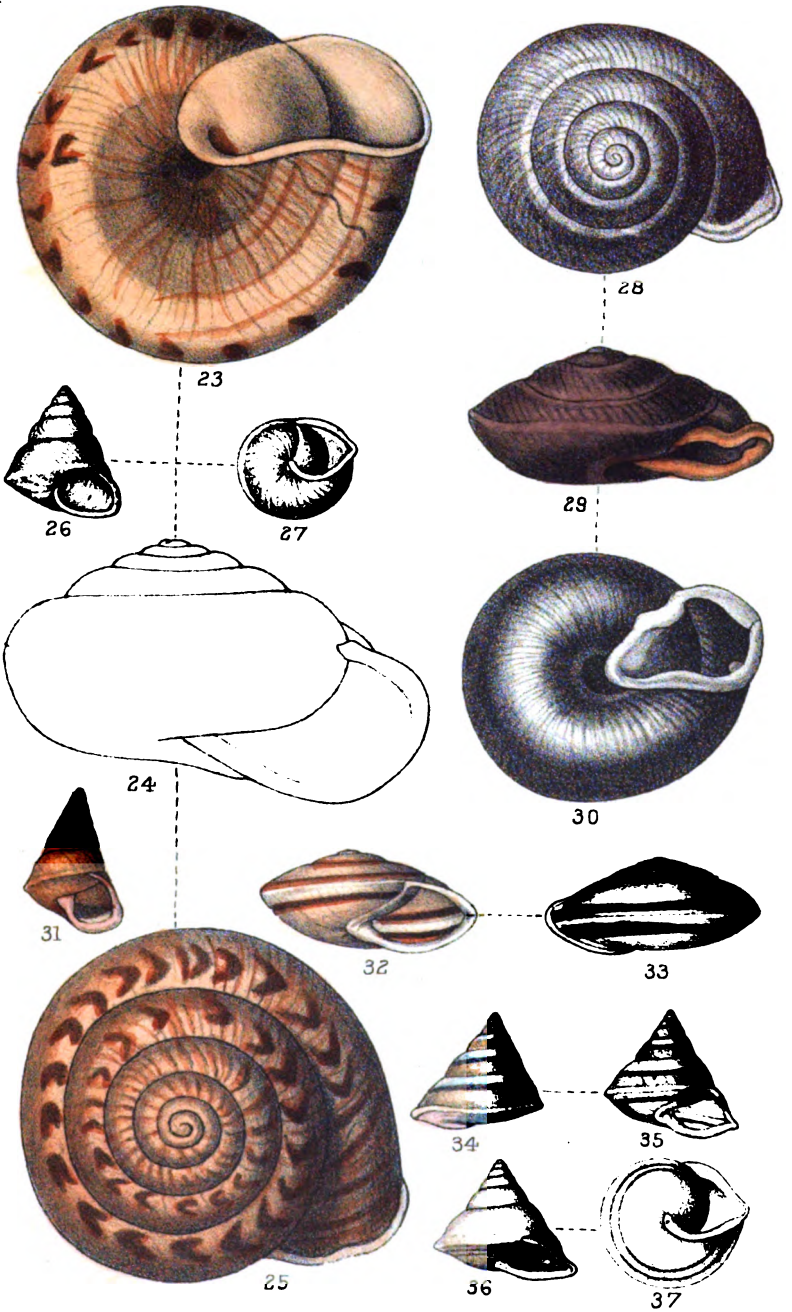

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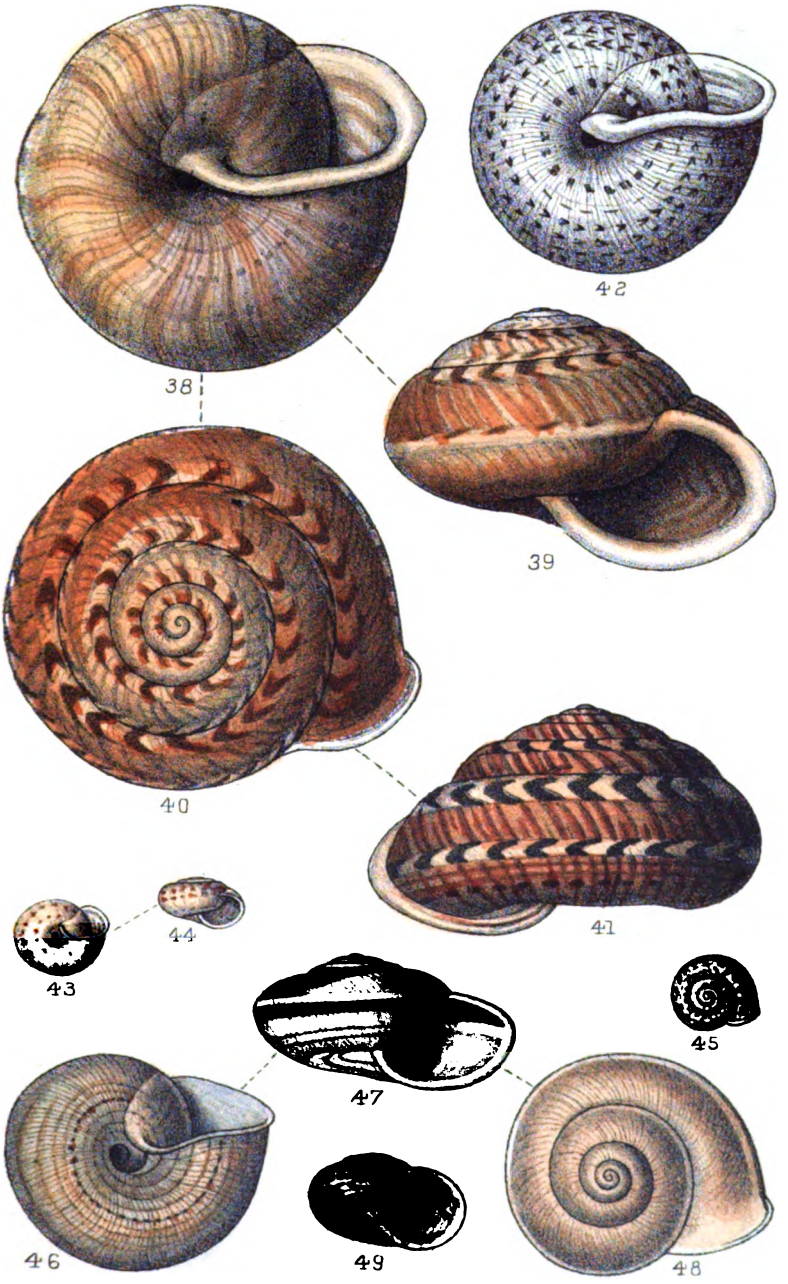

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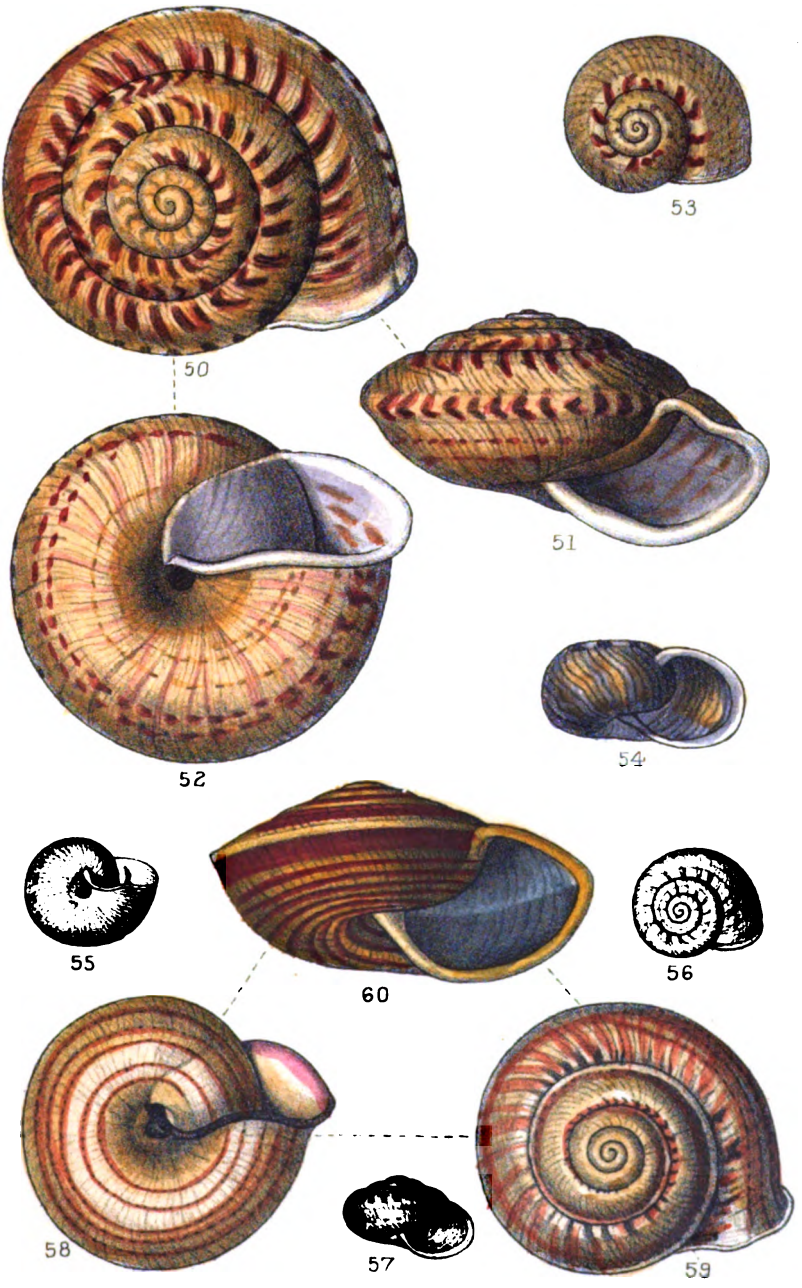

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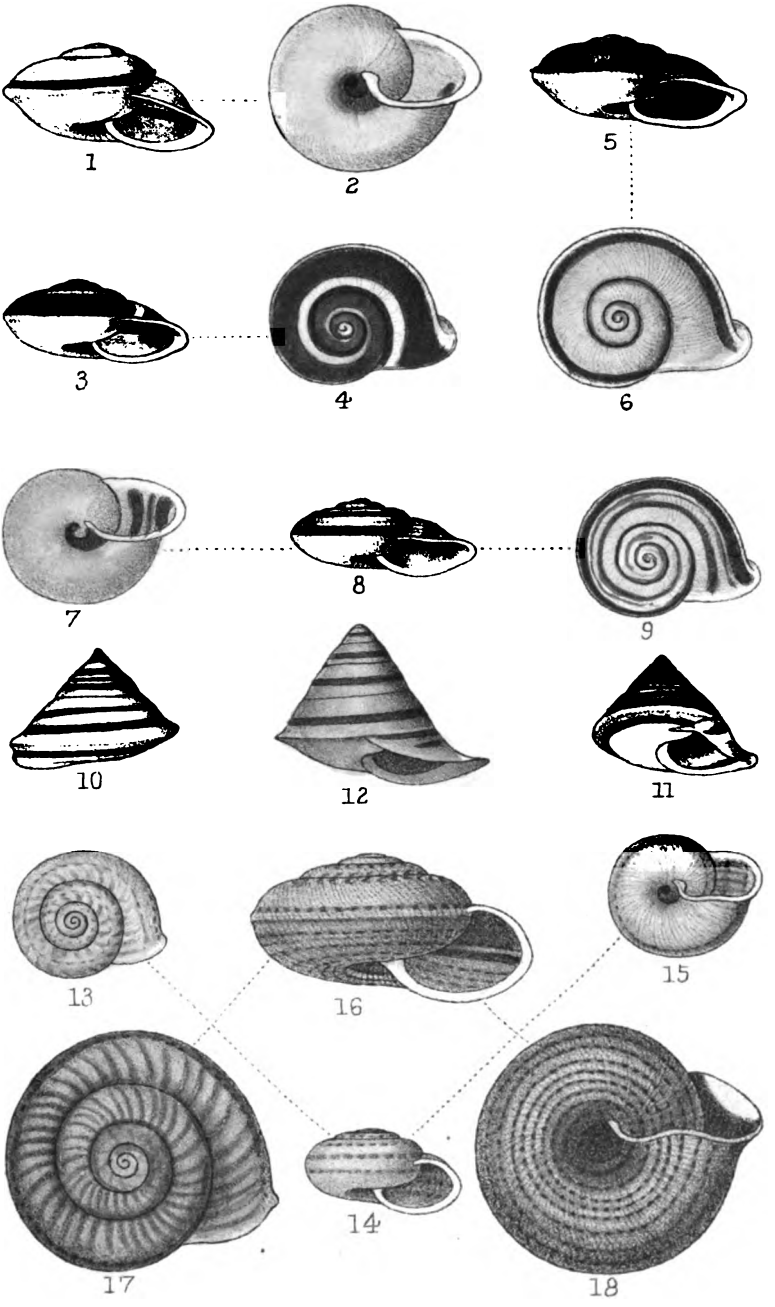

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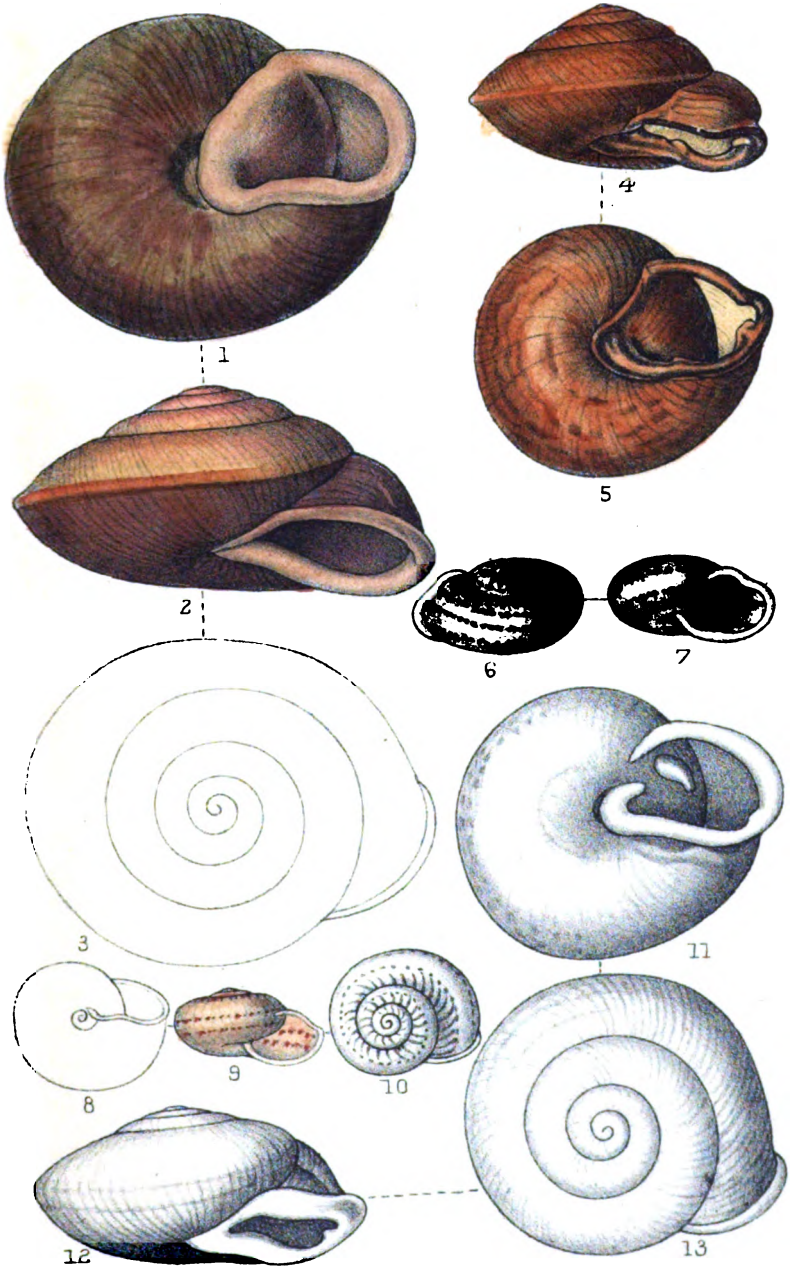

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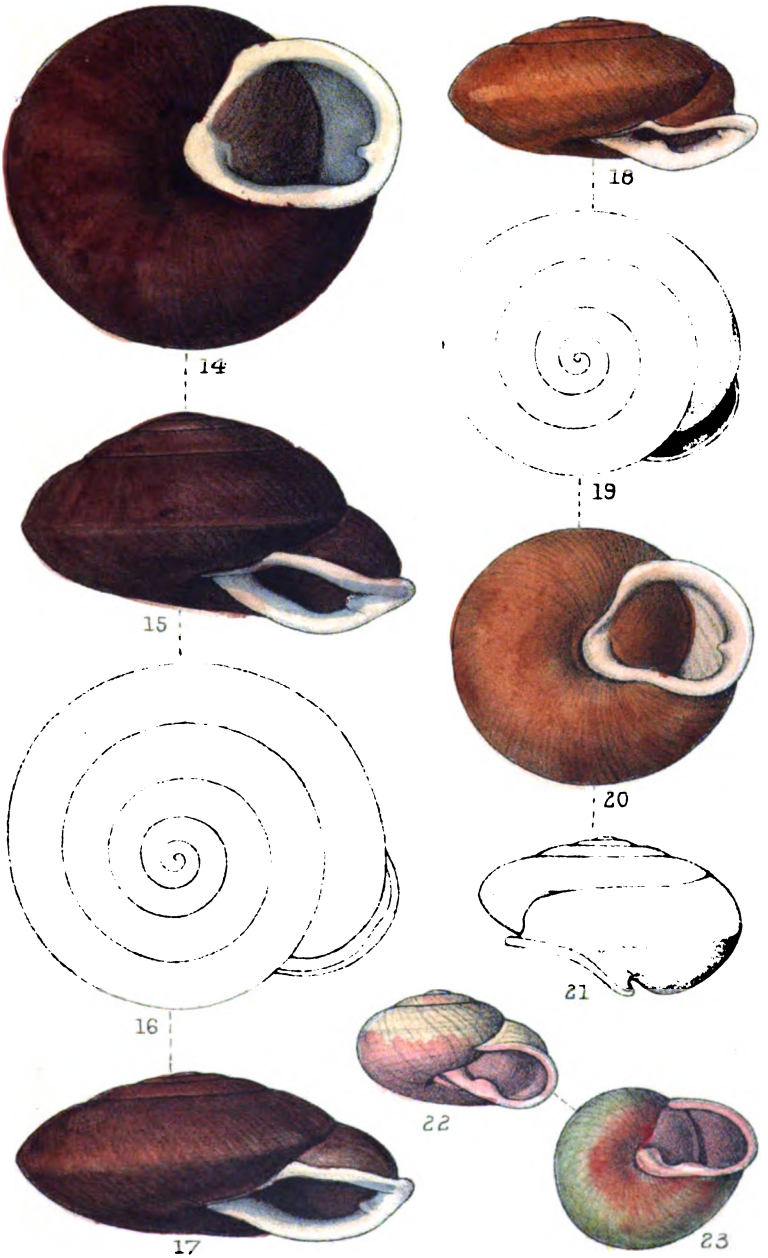

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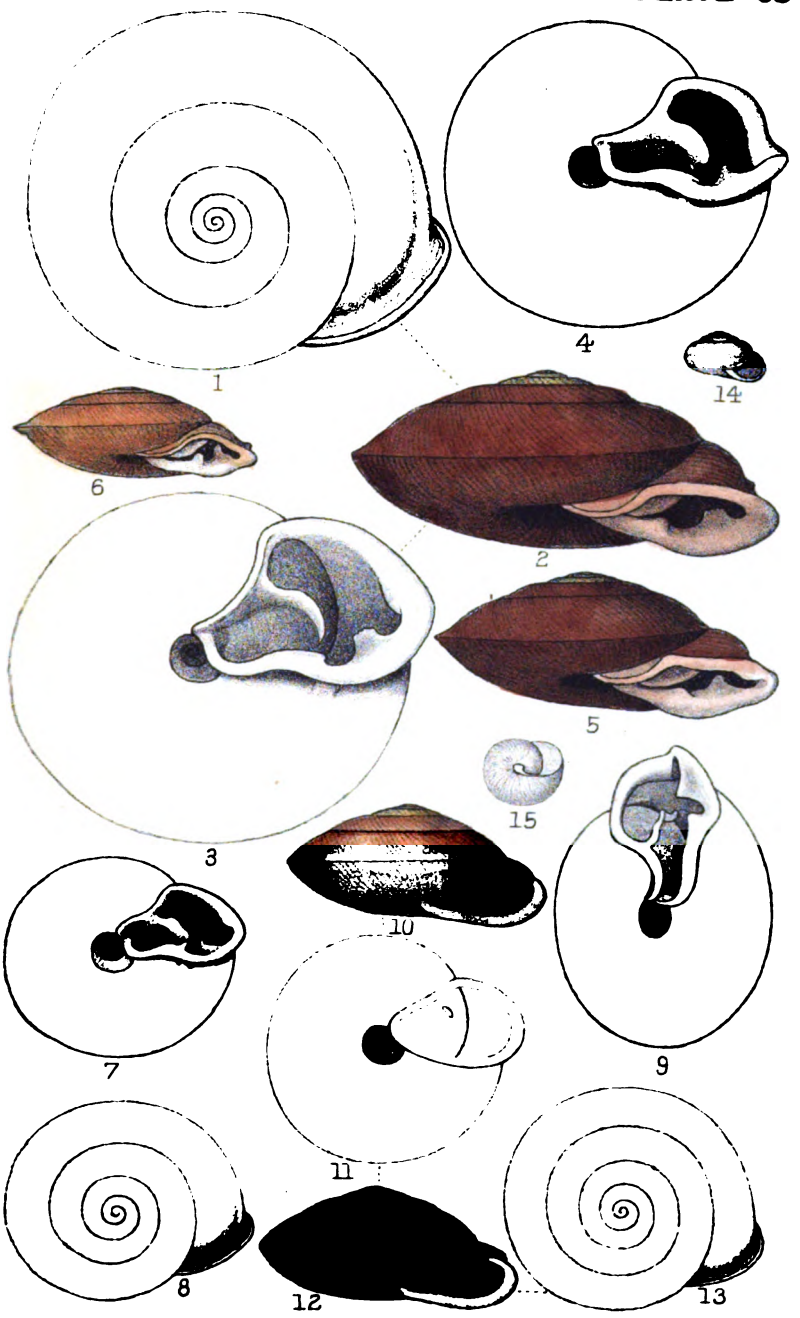

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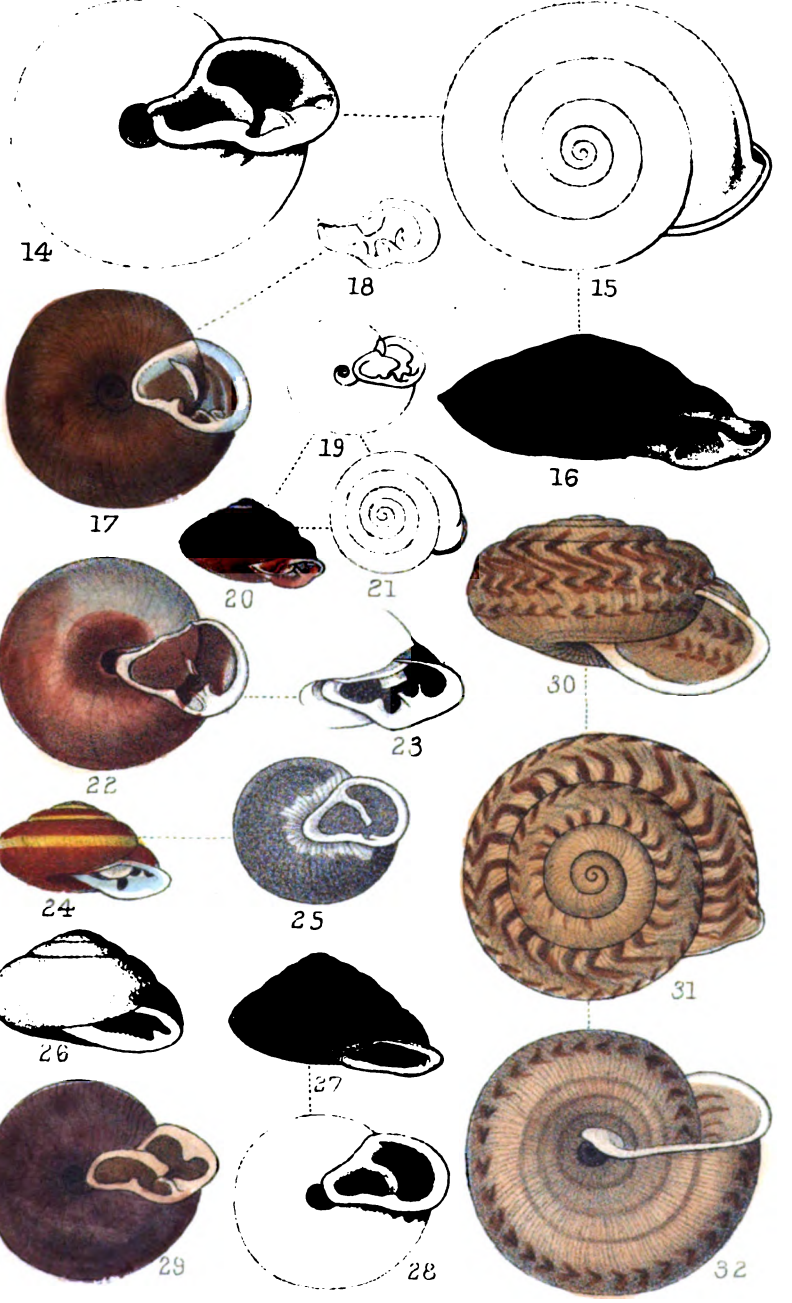
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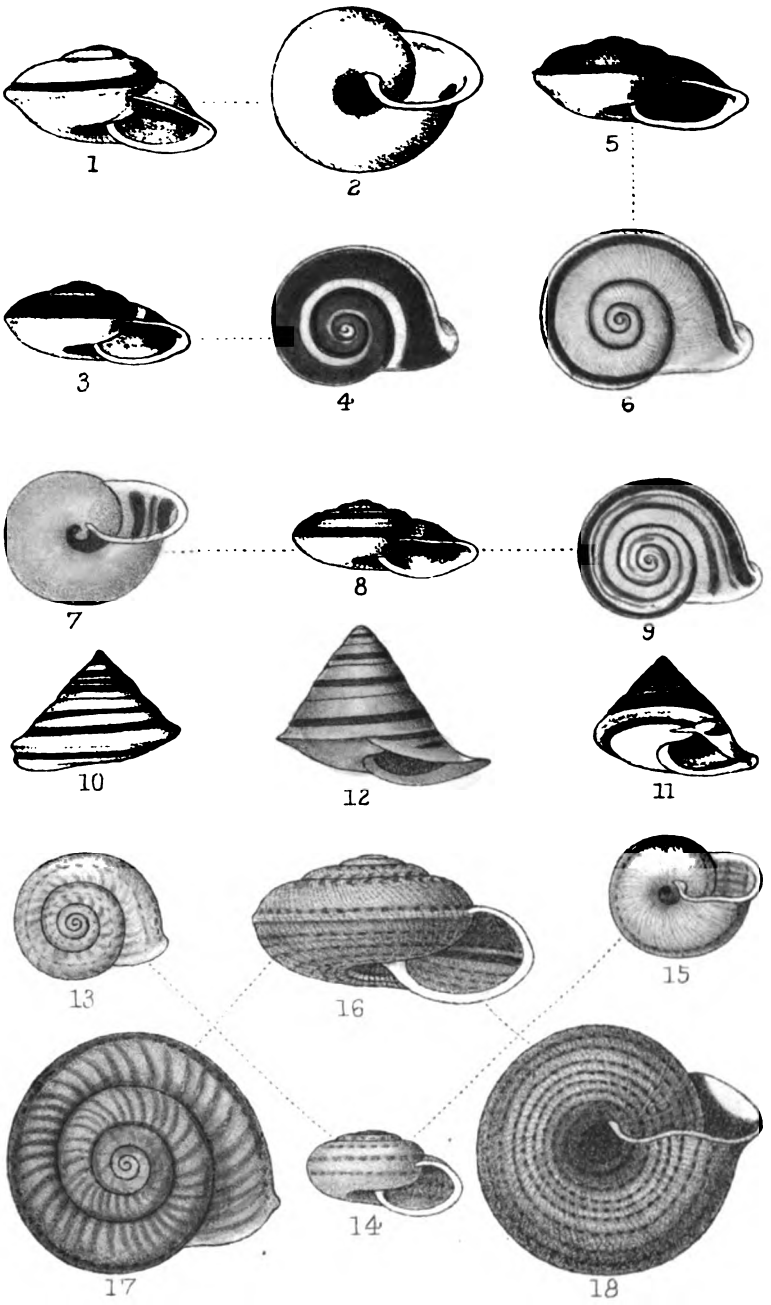

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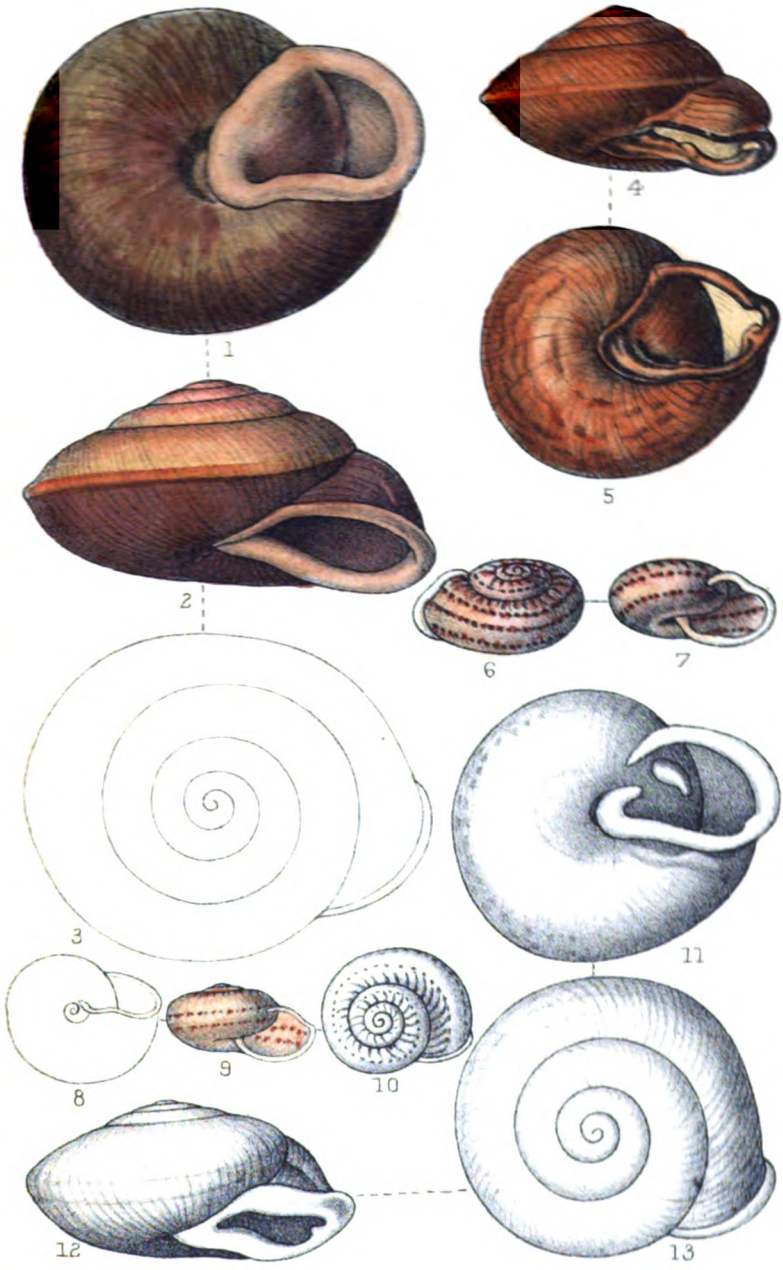

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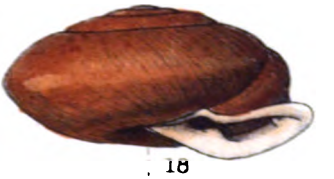

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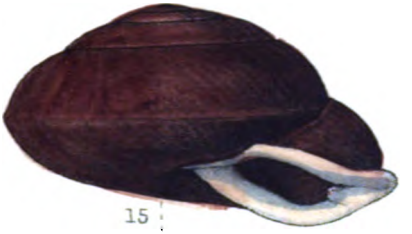

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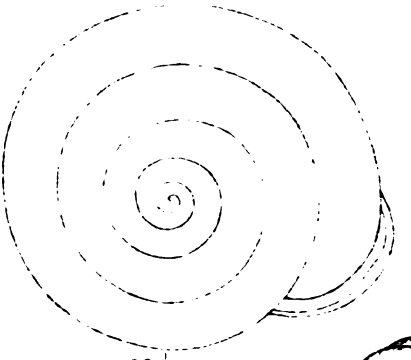

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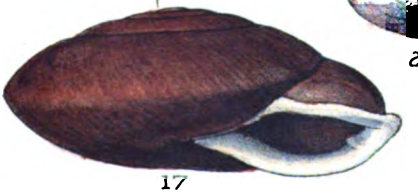

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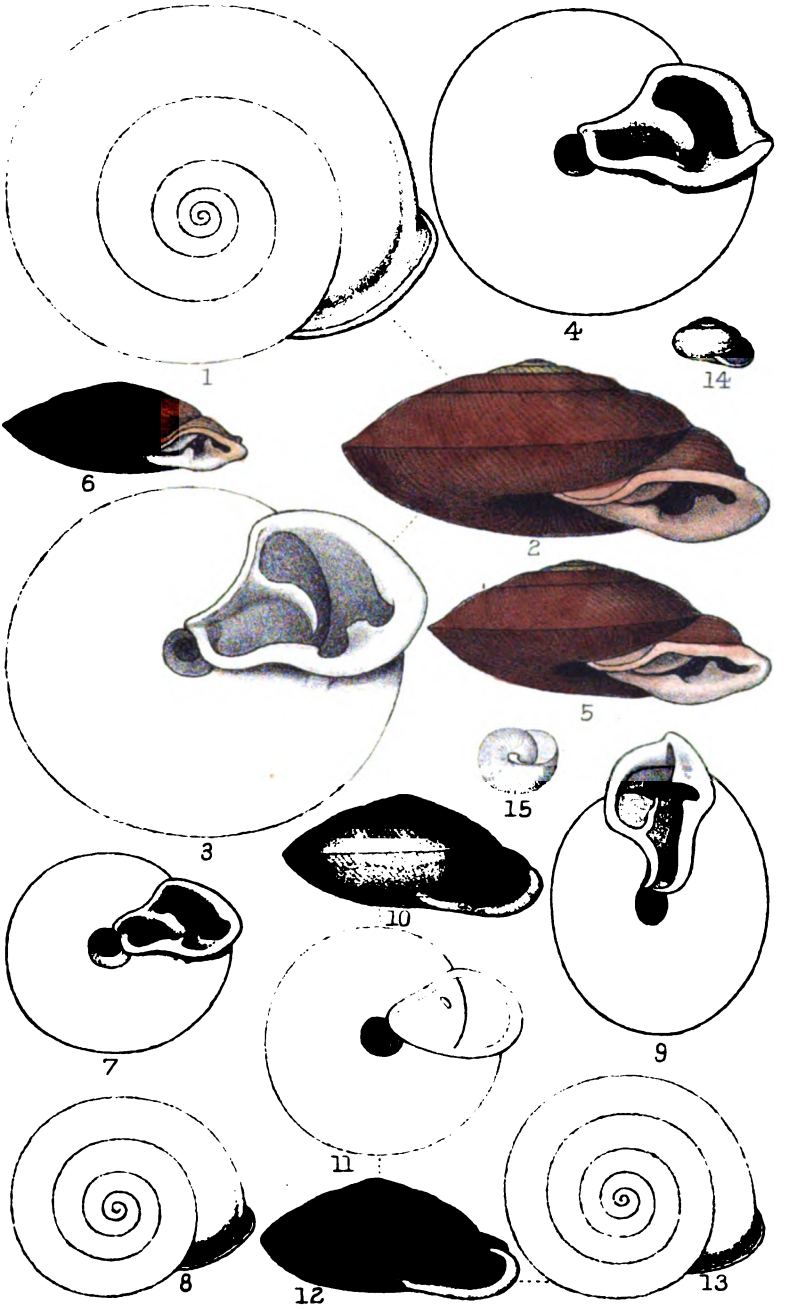

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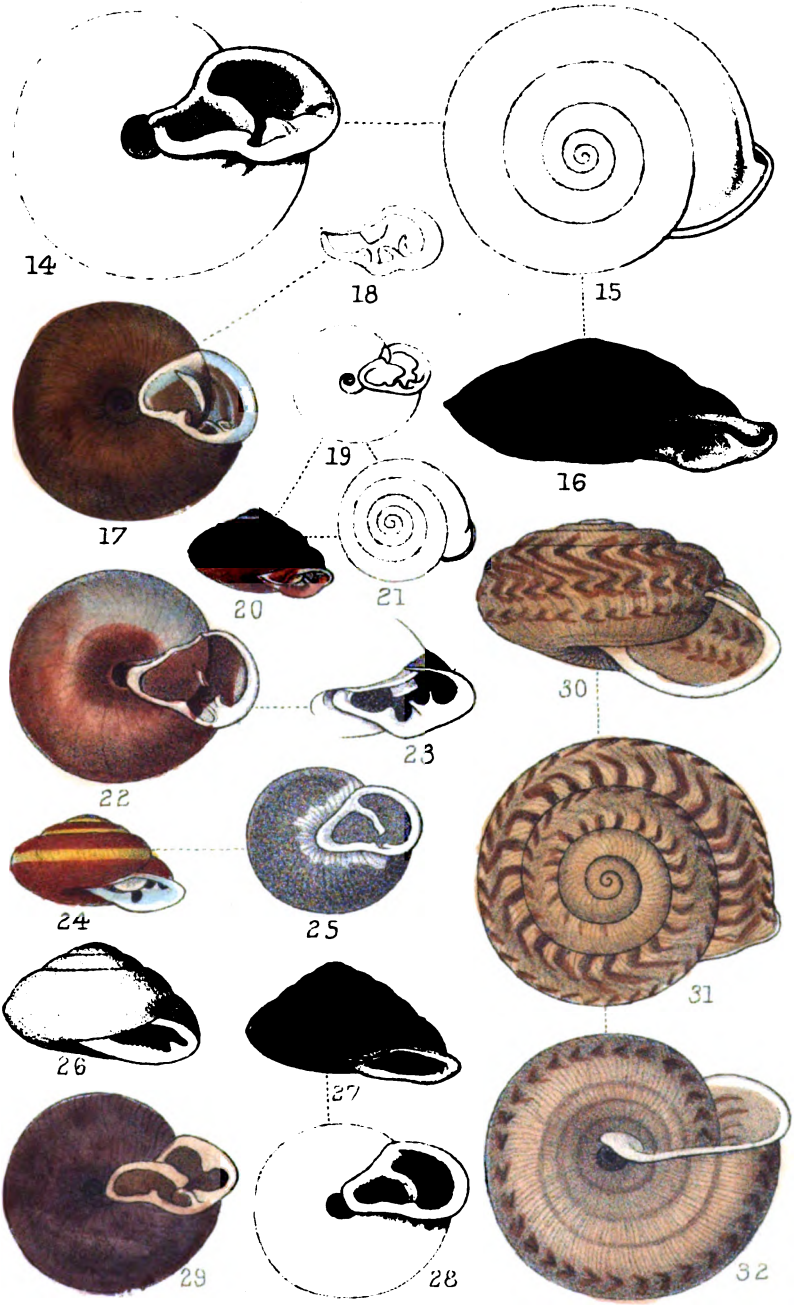

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